1005268

2023

BENGALI LETTER WRITING, DRAFTING OF REPORT, PRÉCIS WRITING, COMPOSITION AND TRANSLATION

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

১। *যে কোনো একটি* বিষয় অবলম্বন করে সংবাদপত্রের সম্পাদকের উদ্দেশ্যে ১৫০ শব্দের মধ্যে একটি পত্র রচনা করুন ঃ ৪০

(ক) পরমাণু যুদ্ধের আশঙ্কায় সমস্ত পৃথিবী আজ আতঙ্কিত।

(খ) মহামারী প্রমাণ করে দিয়েছে যে পৃথিবী থেকে মানবতাবোধ এখনও মুছে যায়নি।

(গ) সমগ্র ভারতে বেকারত্বের ভয়াবহতা শিক্ষিত যুব সমাজের মধ্যে নিদারুণ হতাশা ও প্রথাগত শিক্ষার প্রতি অনীহা এনে দিয়েছে।

২। নিম্নলিখিত বিষয় অবলম্বনে ২০০ শব্দের মধ্যে একটি প্রতিবেদন রচনা করুন ঃ ৪০

'উগ্রপ্রাদেশিকতা ভারতের সামগ্রিক উন্নতির অন্যতম প্রধান অন্তরায়'।

৩। নিম্নলিখিত অংশটির সারসংক্ষেপ করুন ও একটি উপযুক্ত শীর্ষনাম দিন ঃ ৪০

অণুবীক্ষণ নামে এক রকম যন্ত্র আছে; তাহাতে ছোট জিনিষকে বড় করিয়া দেখায়; বড় জিনিষকে ছোট দেখাইবার নিমিত্ত উপায় পদার্থ বিদ্যাশাস্ত্রে নির্দিষ্ট থাকিলেও, ঐ উদ্দেশ্যে নির্মিত কোন যন্ত্র আমাদের মধ্যে সর্বদা ব্যবহৃত হয় না। কিন্তু বিদ্যাসাগরের জীবন চরিত বড় জিনিষকে ছোট দেখাইবার জন্য নির্ম্মিত যন্ত্রস্বরূপ। আমাদের দেশের মধ্যে যাহারা খুব বড় বলিয়া আমাদের নিকট পরিচিত, ঐ গ্রন্থ একখানি সম্মুখে ধরিবা মাত্র তাঁহারা সহসা অতি ক্ষুদ্র হইয়া পড়েন; এবং এই যে বাঙ্গালীত্ব লইয়া আমরা আহোরাত্র আন্দোলন করিয়া থাকি, তাহাও অতি ক্ষুদ্র ও শীর্ণ কলেবর ধারণ করে। দুই চতুষ্পার্শ্বস্থ ক্ষুদ্রতার মধ্যস্থলে বিদ্যাসাগরের মূর্ত্তি ধবল-পর্ব্বতের ন্যায় শীর্ষ তুলিয়া দণ্ডায়মান থাকে; কাহারো সাধ্য নাই যে সেই উচ্চ চূড়া অতিক্রম করে বা স্পর্শ করে।

৪। গদ্যাংশটি অবলম্বন করে উল্লিখিত প্রশ্নগুলির উত্তর দিন ঃ ১০×৪=৪০

শহরের ধনী মহাজনের কারখানার মজুরি করিতে গেলে শ্রমীদিগের মনুষ্যত্ব কিরূপ নষ্ট হয় সকলেই জানেন। বিশেষত আমাদের যে দেশের সমাজ গৃহের উপর প্রতিষ্ঠিত সেখানে গৃহনীতি বিচলিত হইলে ধর্মের প্রধান অবলম্বন জীর্ণ হইয়া পড়ে ও সমাজের মর্মস্থানে বিষ সঞ্চার হইতে থাকে সে দেশে বড়ো বড়ো কারখানা যদি শহরের মধ্যে আবর্ত রচনা করিয়া চারিদিকের গ্রামপল্লী হইতে দরিদ্র গৃহস্থ দিগকে আকর্ষণ করিয়া আনে তবে স্বাভাবিক অবস্থা হইতে বিচ্যুত, বাসস্থান হইতে বিশ্লিষ্ট স্ত্রী-পুরুষগণ নিরানন্দকর কলের কাজে ক্রমশই কিরূপ দুর্গতির মধ্যে নিমজ্জিত হইতে পারে তাহা অনুমান করা কঠিন নহে। কলের দ্বারা কেবল জিনিসপত্রের উপচয় করিতে গিয়া মানুষের অপচয় করিয়া বসিলে সমাজের অধিক দিন তাহা সহিবে না। অতএব পল্লিবাসীরাই একত্রে মিলিলে যে-সকল যন্ত্রের ব্যবহার সম্ভবপর হয় তাহারই সাহায্যে স্বস্থানেই কর্মের উন্নতি করিতে পারিলে সকল দিক রক্ষা হইতে পারে। শুধু তাই নয়, দেশের জনসাধারণকে ঐক্যনীতিতে দীক্ষিত করিবার এই একটি উপায়। প্রাদেশিক সভা উপদেশ ও দৃষ্টান্ত দ্বারা একটি মণ্ডলীকেও যদি এইরূপে গড়িয়া তুলিতে পারেন তবে এই দৃষ্টান্তের সফলতা দেখিতে দেখিতে চারিদিকে ব্যাপ্ত হইয়া পড়িবে।

এমনি করিয়া ভারতবর্ষের প্রদেশগুলি আত্মনির্ভরশীল ও ব্যূহবদ্ধ হইয়া উঠিলে ভারতবর্ষের দেশগুলির মধ্যে তাহার কেন্দ্রের প্রতিষ্ঠা সার্থক হইয়া উঠিবে এবং সেই দৈশিক কেন্দ্রগুলি একটি মহাদেশিক কেন্দ্রচূড়ায় পরিণত হইবে। তখন সেই কেন্দ্রটি ভারতবর্ষের সত্যকার কেন্দ্র হইবে। নতুবা পরিধি যাহার প্রস্তুতই হয় নাই সেই কেন্দ্রের প্রামাণিকতা কোথায়। যাহার মধ্যে দেশের কর্মের কোন উদ্‌যোগ নাই, কেবলমাত্র দুর্বল জাতির দাবি এবং দায়িত্বহীন পরামর্শ, সে সভা দেশের রাজকর্মসভার সহযোগী হইবার আশা করিবে কোন সত্যের এবং কোন শক্তির বলে।

(ক) শহরের বুকে কলকারখানা স্থাপনের ফলে মানুষের জীবনে কী সমস্যা দেখা দিয়েছে?

(খ) দেশের জনসাধারণকে একই ঐক্যনীতিতে দীক্ষিত করার অন্যতম উপায় কী?

(গ) লেখকের মতে ভারতবর্ষের প্রদেশগুলি কীভাবে আত্মনির্ভরশীল হতে পারে?

(ঘ) ব্রিটিশ শাসন আমাদের গ্রাম্য সমাজের সহজ ব্যবস্থাকে কীভাবে নষ্ট করে দিয়েছে?

৫। নিম্নলিখিত যে কোনো একটি বিষয়ের বাংলা অনুবাদ করুন ঃ ৪০

(ক) I love children. On coming to Rastrapati Bhavan, I have met them sometimes through video conference and sometimes directly. After talking with them, I have formed an idea about their opinion and view points on different matters. We always bother about big issues, but quite often forget to pay attention to the smaller ones. On many occasions, their comments on these minor problems are such as to show how strong their power of comprehension. The problem lies with setting up of our precedence. Sitting in Delhi, it is felt perhaps nothing could be more serious an issue than this. But this big country has many states having different kinds of problems. When I talk to a farmer at a remote village and find how he tries to bring up his child with proper education, I feel amazed at the diversity of this vast country.

(খ) So long we have tried to learn only one language in the main, English, besides the mother tongue. This has three-fold objects — earning our bread, intercourse with foreigners and acquisition of knowledge in various subjects. When Hindi will become the official language of the country, it will not be possible for us to earn our living with knowledge of English only. Hindi will be indispensable in government service and in profession like law. Conversation with the people of the other provinces of India also shall have to be carried on mainly in Hindi. But English must have to be learnt by those who would go in for higher education or like to keep in touch with all the countries of the world. No doubt, in future also many will be able to earn their living without learning Hindi; just as many do it now by agriculture, industry, trade and physical labour without learning English.

HINDI LETTER WRITING, DRAFTING OF REPORT, PRÉCIS WRITING, COMPOSITION AND TRANSLATION

1. किसी एक विषय पर किसी समाचार पत्र के संपादक को पत्र लिखिए : (अधिकतम 150 शब्दों में।)
[Write a letter in about 150 words (*any one*)] : 40

(क) साइबर अपराध

(ख) डेंगू का बढ़ता प्रकोप

(ग) चुनाव के दिनों में पोस्टरों से होनेवाली असुविधा

2. निम्नलिखित विषय पर 200 शब्दों में एक संपादकीय प्रतिवेदन लिखिए (Write a report within 200 words): 40

आधुनिक विकास और बढ़ते वृद्धाश्रम

3. निम्नलिखित गद्यांश का सारांश लिखिए (Write a précis of the following passage in Hindi): 40

इस बहुरंगी संसार में भाँति-भाँति के लोग रहते हैं । उन सबमें समानता नहीं होती है। कुछ स्वार्थी होते हैं तो कुछ परमार्थी, कुछ लालची तो कुछ लालच रहित, परन्तु हमारे लिए यह पहचानना मुश्किल हो जाता है कि कौन सा व्यक्ति स्वार्थी है। वह दिखने में तो एक सामान्य व्यक्ति की ही तरह दिखाई देता है। उसकी कोई अलग विशिष्ट पहचान नहीं होती। जब तक उस व्यक्ति से हमारा कोई काम न पड़े और यह सिद्ध न हो जाए कि वह स्वार्थी है तब तक उसकी पहचान नहीं होती है। लालची लोगों को बगैर उनके व्यवहार से परिचित हुए पहचानना अत्यंत मुश्किल कार्य है। स्वार्थ और लालच किसी व्यक्ति के दुर्गुण हैं । अत: बाहर से देखकर इसकी पहचान नहीं की जा सकती। इसकी पहचान तो केवल व्यक्ति के व्यवहार द्वारा ही संभव है। स्वार्थी और लालची लोगों के न तो सींग हुआ करते हैं और न ही कोई खास किस्म का झंडा-पताका।

4. प्रस्तुत गद्यांश के आधार पर दिए गये प्रश्नों के उत्तर दीजिए (Read the following text carefully and write the answers of the questions): 10×4=40

विज्ञान के अद्भुत चमत्कारों में से एक है कंप्यूटर और कंप्यूटर में प्राप्त इंटरनेट की सुविधा तो अद्भुत है। इसने आज पूरे संसार को एक सूत्र में बाँध रखा है। इंटरनेट की सुविधा ने ज्ञान के क्षेत्र में अद्भुत क्रांति ला दी है। आज किसी भी व्यक्ति को दुनिया के किसी भी कोने की कोई भी जानकारी चाहिए तो उसे इंटरनेट पर सहज ही प्राप्त हो जाती है। इंटरनेट आज मनोरंजन और ज्ञान विस्तार का सबसे अच्छा साधन बन गया है। इन सभी सुविधाओं के साथ-साथ इससे फैलने वाली कुछ बुराईयाँ भी आज विस्तार पा रही हैं । इसका दुरूपयोग करने वाले भी कम नहीं हैं । आज इंटरनेट का सही प्रयोग वरदान और गलत प्रयोग अभिशाप बनता जा रहा है। अब यह मनुष्य को सोचना है कि वह चाहता क्या है?

(क) उपर्युक्त गद्यांश के लिए उपयुक्त शीर्षक लिखिए।

(ख) इंटरनेट के सही और गलत प्रयोग पर अपना विचार व्यक्त कीजिए।

(ग) रेखांकित पंक्तियों का आशय स्पष्ट कीजिए।

(घ) उपर्युक्त गद्यांश का सारांश अपने शब्दों में लिखिए।

5. हिंदी में अनुवाद कीजिए (Translate *any one* into Hindi) : 40

(a) I love children. On coming to Rastrapati Bhavan, I have met them sometimes through video conference and sometimes directly. After talking with them, I have formed an idea about their opinion and view points on different matters. We always bother about big issues, but quite often forget to pay attention to the smaller ones. On many occasions, their comments on these minor problems are such as to show how strong their power of comprehension. The problem lies with setting up of our precedence. Sitting in Delhi, it is felt perhaps nothing could be more serious an issue than this. But this big country has many states having different kinds of problems. When I talk to a farmer at a remote village and find how he tries to bring up his child with proper education, I feel amazed at the diversity of this vast country.

(b) So long we have tried to learn only one language in the main, English, besides the mother tongue. This has three-fold objects — earning our bread, intercourse with foreigners and acquisition of knowledge in various subjects. When Hindi will become the official language of the country, it will not be possible for us to earn our living with knowledge of English only Hindi will be indispensable in government service and in profession like law. Conversation with the people of the other provinces of India also shall have to be carried on mainly in Hindi. But English must have to be learnt by those who would go in for higher education or like to keep in touch with all the countries of the world. No doubt, in future also many will be able to earn their living without learning Hindi; just as many do it now by agriculture, industry, trade and physical labour without learning English.

URDU LETTER WRITING, DRAFTING OF REPORTS, PRÉCIS WRITING, COMPOSITION AND TRANSLATION

1. Write a letter from the following topics to the editor of an Urdu newspaper within 150 wards. Write X, Y, Z instade of your name : 40

(الف) محکمہ جنگلات کی بڑھتی ہوئی ذمہ داریاں

(ب) کلکتے کی ٹرام گاڑیاں۔ ماضی، حال اور مستقبل

(ج) موسم برسات اور عام شاہ راہیں

2. Draft a report on the following topics within 200 words. 40

موجودہ معاشرے پر کمپیوٹر کے بڑھتے ہوئے اثرات

3. Write a Précis of the following passage in Urdu (Use special prècis sheet provide for this purpose): 40

محمد تغلق نے جب سلطنت کی باگ دوڑ سنبھالی تو اس نے انتظامی امور کو بڑی حد تک حسب سابق رکھا۔ زبانوں کے مابین لین دین بھی جاری رہا لیکن جو غیر معمولی واقعہ پیش آیا وہ پایہ تخت کی تبدیلی ہے۔ محمد تغلق کے بارے میں کہنے والے بہت کچھ کہتے ہیں۔ منفی بھی مثبت بھی، اچھا بھی، برا بھی، لیکن مورخین اس کی فہم وفراست، دانائی و دانشمندی، دور اندیشی اور احتیاط پسندی کے لیے بھی رطب اللسان ہیں۔ اس نے بلاشبہ کئی پہلوؤں پر غور کیا ہوگا۔ سلطنت دہلی کے بڑھتے ہوئے حدود کے باعث، چوں کہ دہلی اب ملک کے وسط میں نہیں رہی تھی اس لیے رسد و سائل اور پیغام رسانی کی موجودہ سہولتیں ہوتیں تو اور بات تھی لیکن ان دنوں دہلی سے دکن کے علاقوں کو سپاہ اور رسد کی روانگی اور پیغامات اور احکامات کی ترسیل کا رے دار تھی۔ چنانچہ ان زاویوں ہی سے غور کر کے محمد تغلق نے غالباً دکن، مالوہ بلکہ گجرات پر بھی بہتر طریقے پر کنٹرول کرنے کے لیے پایہ تخت کی تبدیلی کا حکم دیا ہوگا۔ یہ 1327ء کی بات ہے۔ محمد تغلق نے فرمان جاری کیا کہ شہر دہلی کی کل آبادی دولت آباد ہجرت کرے۔ مورخین ہجرت کے سلسلے میں اس کو تاریخ کا سب سے بڑا اور حیرت انگیز واقعہ قرار دیتے ہیں۔ کہا جاتا ہے، لگتا تھا کہ دہلی ویران ہوگئی، صرف افواج، حکومت اور محکموں میں کام کرنے والے ہی نہیں، تاجر پیشہ، ہنرمند، پیشہ ور، فن کار، کاریگر، علما، ادبا اور شعراء سب کے لیے یہ حکم تھا اور پوری سختی کے ساتھ۔ اور وہ لوگ جنھوں نے ہجرت نہیں کرنی چاہی انہیں ہجرت کے لیے مجبور کیا گیا۔ غرض کہ دہلی خالی ہوگئی۔ دولت آباد میں ہر طرح، ہر مزاج اور مذاق کے لوگ آئے، بسے اور یہاں ایک نئی دہلی آباد ہوگئی۔ کہا جاتا ہے کہ ہر روز بے اندازہ پالکیوں میں لوگ دولت آباد آیا کرتے تھے۔

4. Read the following text carefully and write the answers of the questions: 10×4=40

اقبال نے جس دور میں شعر گوئی کا آغاز کیا، اس دور میں شعری اصناف میں محض غزل اور نظم کی اہمیت باقی رہ گئی تھی۔ مثنوی اور قصیدہ جیسی اصناف کو زوال آچکا تھا۔ کربلائی مرثیے کی جگہ شخصی مرثیے کو قبولیت حاصل ہو رہی تھی۔ اقبال نے ہر صنف شاعری کو اپنے کلام کا وسیلہ بنایا چنانچہ حمد، نعت، منقبت، مثنوی، ساقی نامہ، شہر آشوب، نظم اور شخصی مرثیہ جیسی اصناف ان کی شاعری میں موجود ہیں۔ اقبال نے شاعری کو فکر و فلسفہ سے وابستہ کیا۔ چنانچہ ان کی نظموں اور غزلوں میں اسی روش کی کارفرمائی موجود ہے۔ اقبال کی شاعری غزل کے ذریعہ بھی اپنا اثر دکھاتی ہے اور اس کے ساتھ ہی نظم گوئی میں بھی انہوں نے اپنی انفرادیت کا لوہا منوایا۔ اقبال کے عہد میں غزل گوئی کے تین رجحانات روایتی غزل، مسائلی غزل اور متصوفانہ غزل سامنے آتے ہیں۔ یہ رجحانات ظاہر کرتے

ہیں کہ اقبال کی غزل گوئی نے اپنے عہد کو متاثر کیا۔ اقبال کے دور کے غزل گو شعرا میں فصاحت جنگ جلیل، فانی بدایونی، یگانہ چنگیزی، شاد عظیم آبادی، ریاض خیرآبادی، جگر مرادآبادی، سیماب اکبرآبادی، عزیز لکھنوی، اصغر گونڈوی، فراق گورکھپوری اور جمیل مظہری کی غزلوں اور ان کے کارناموں سے واقفیت کے بعد یہ اندازہ ہوتا ہے کہ بیشتر غزل گو شعرا تعلیم یافتہ ہونے کی وجہ سے دانشورانہ فکر کے حامل تھے اور اقبال کی غزلوں کے فکری آہنگ نے انہیں متاثر کیا۔ یہی حال اقبال کے دور کی نظم گو شعرا کا ہے اقبال کی فکر انگیز شاعری کے وہ مداح رہے چنانچہ اکبر الہ آبادی، نظم طباطبائی، اسمٰعیل میرٹھی، جوش ملیح آبادی، برج نارائن چکبست، سرور جہاں آبادی، حفیظ جالندھری، تلوک چند محروم اور عظمت اللہ خان کی نظم نگاری کے پس منظر میں یہ بات ظاہر ہوتی ہے کہ اقبال نے اپنے عہد کے نظم نگاروں کو متاثر کیا۔ اس طرح عہد اقبال میں غزل اور نظم کے شاعروں کے تعارف سے اندازہ ہوتا ہے کہ یہ تمام دور اہل علم کا رہا اور انہیں اقبال کی غزلوں اور نظموں نے حد درجہ متاثر کیا اور خود اقبال اپنے معاصر شعراء سے حد درجہ یگانگت رکھتے تھے۔ اقبال کے خطوط اس قول کی تصدیق کرتے ہیں کہ اقبال نے اپنے ہم عصر شعراء سے رابطہ قائم کرنا ضروری سمجھا۔ اقبال کی شخصیت کا یہ بھی ایک اہم پہلو ہے کہ انہوں نے معاصرانہ چشمک کو خاطر میں نہ لا کر اردو شاعری کی تاریخ کو ایک نیا موڑ دیا ہے۔

(i) اقبال کے عہد میں غزل گوئی کے کون کون سے تین رجحانات تھے؟ بحث کیجئے۔

(ii) اقبال کی غزلوں کی فکری آہنگ سے بحث کیجئے۔

(iii) اقبال کی نظموں کے حوالے سے اپنے خیالات کا اظہار کیجئے۔

(iv) اقبال نے اردو شاعری کی تاریخ کو ایک نیا موڑ دیا۔ اس خیال کی وضاحت کیجئے۔

5. Translate into Urdu: 40

(a) I love children. On coming to Rastrapati Bhavan, I have met them sometimes through video conference and sometimes directly. After talking with them, I have formed an idea about their opinion and view points on different matters. We always bother about big issues, but quite often forget to pay attention to the smaller ones. On many occasions, their comments on these minor problems are such as to show how strong their power of comprehension. The problem lies with setting up of our precedence. Sitting in Delhi, it is felt perhaps nothing could be more serious an issue than this. But this big country has many states having different kinds of problems. When I talk to a farmer at a remote village and find how he tries to bring up his child with proper education, I feel amazed at the diversity of this vast country.

(b) So long we have tried to learn only one language in the main, English, besides the mother tongue. This has three-fold objects — earning our bread, intercourse with foreigners and acquisition of knowledge in various subjects. When Hindi will become the official language of the country, it will not be possible for us to earn our living with knowledge of English only Hindi will be indispensable in government service and in profession like law. Conversation with the people of the other provinces of India also shall have to be carried on mainly in Hindi. But English must have to be learnt by those who would go in for higher education or like to keep in touch with all the countries of the world. No doubt, in future also many will be able to earn their living without learning Hindi; just as many do it now by agriculture, industry, trade and physical labour without learning English.

NEPALI LETTER WRITING, DRAFTING OF REPORT, PRÉCIS WRITING, COMPOSITION AND TRANSLATION

1. Write a letter on *any one* of the following. (Within 150 words): 40
तलका मध्ये *कुनै एउटा* विषया लगभग 150 शब्दभित्र एउटा पत्र लेख्नुहोस् :

(क) वर्षाकालमा भल-पहिरोबाट आफ्नो गाँउमा भएको क्षति र प्रशासनबाट पाइने सहयोगबारे सम्बन्धित अधिकारीलाई पत्र लेख्नुहोस्।

(ख) सामाजिक सञ्जल प्रयोगमा लापरवाहीले गर्दा तपाईंले भोग्नु परेको समस्या जनाएर सम्बन्धित अधिकारीलाई एउटा ज्ञापन पत्र लेख्नुहोस्।

2. Draft a report on *any one* of the following. (Within 200 words): 40
तलका *कुनै एउटा* विषयमा प्रतिवेदन लेख्नुहोस् (200 शब्दभित्र) :

(क) भारतमा शिक्षाको अधिकार

(ख) व्यक्तित्व विकासमा खेलकुदको महत्व

3. Write a Précis of the following passage: 40
निम्नलिखित गद्यांशको सार संक्षेप लेख्नुहोस् :

मान्छे भन्ने चैतन्य पशुको सर्वप्रथम चेतनामा महसूम हुन आएको प्रथम आवश्यकता यदि पहिलाउँदै गयौं भने हामीलाई अनुमान गर्न कर लाग्छ कि यो नितान्त आवश्यकीय वस्तु घर रहेछ। आदिम कालमा मान्छेलाई खाद्य समस्या थिएन किनभने त्यस समय जति वनस्पती, फल-फूल, कन्दमूल र शिकारको प्रचुरता थियो भने उतिकै जनसङ्ख्याको अल्पता थियो। तर मान्छेलाई, त्यस बखत, रातको भयावह अन्धकार, हुरी बतास र पानी-पहिरोको भीषणतादेखि बाँच्ने सुरक्षित घर भने थिएन जुन अभावले गर्दा मान्छेको निकै लामो ताँती सन्ततिले कतिपय युगहरूसम्मन् विकट सङ्घर्ष गरिरहनु परेको देखिन्छ। शायद सङ्कटकालीन अवस्थामा ओढ़ारभित्र पस्दा, त्यहाँ पनि हिंस्रक जानवरहरूसित लड़ाई गर्नु पर्यो होला र यस्तै यस्तै सङ्घर्षहरूबाट मानिसले अन्त्यमा, कतिपय दुर्भाग्यपूर्ण युगहरू पश्चात् मानव संस्कारमा खटकिरहेको घर भन्ने वस्तुको आवश्यकता पूर्ण गर्यो होला। ठुला ठुला वृक्षहरूका आड़मा अत: विशाल ढुङ्गाहरूका थाकमा केही संशोधन र रूप परिवर्तन गरेर अथवा बाँस र खरको सङ्कलित छाजनमा ढुङ्गाहरूका देवल उठाएर र यस्तै क्रमले मान्छेहरू आज पनि इस्पातको गगनचुम्बी घरहरू समेत निर्माण गरिरहेछन् यसर्थ नै कि यो मानिसको नितान्त आवश्यकीय वस्तु हो। यसैले मानव प्रगतिकालको प्रथम चरणमा घर निर्माण गर्नु एउटा ठूलो कार्यसिद्धि भएको मान्न सकिन्छ-मानव इतिहासमा।

4. Read the following text carefully and write the answers of the questions: 10×4=40
निम्नलिखित अनुच्छेद पढेर तल दिएका प्रश्नहरूका उत्तर लेख्नुहोस् :

जुखुरेकी आमा चियाकमानमा कुल्ली काम गर्थी। उसको लोग्ने, जुखुरेको बाबु पनि कमानमै काम गर्थ्यो। तीनजना छोरा-छोरीमा छोरो जुखुरे चाहिँ सबैभन्दा सानो थियो। दुइ छोरीहरूमा एउटी चाहिँ दश अर्की चाहिँ सात वर्षका थिए। छोरो नजन्मुञ्जेल उसलाई छर छिमेकले पोक्वीको आमा नै भन्थे किनभने जेठी छोरीको नाम थियो पोक्ची। बिहे गरेको दश वर्षपछि छोरो जुखुरे जन्म्यो। केश त्यसको जुक्रुक्क परेको थियो र सबैले उसलाई जुखुरे भन्नथाले। दशैँ आउने महीना लाग्यो। दिन सधैं हुस्स पर्थ्यो। जस्तै दिन भएको बेलामा पनि काममा नगई नहुने। एक दिन, दुइ दिन ढीलो भयो भने हाजिरा चढ्दैन थियो। पानी परेको होस् कि घाम लागेको दिन होस्, बिहान पाँच-छ: बजी नै गन्तीमा पुग्नुपर्छ, नत्र बैदारले हाजिरा नलगाइदिने हुन्। अब बल्ल पानी पर्नु बन्द भो, दशैं आइरहेथ्यो। अब बोनस पाइने भो। यो पालि बोनस पाइयो भने यस्तो गर्छु, उस्तो गर्छु, यो किन्छु, त्यो किन्छु भन्ने स्कीम जुखुरेको बाबुले पनि बनाउँदै थियो। धेरै दिन भयो, उसले जुत्ता किन्ने इच्छा गरेको। कति वर्ष भयोउसले च्यापला मात्र लाएर हिँड़ेको। यो पालि बोनसको पैसाले एक जोड़ा जुत्ता त किन्छु नै किन्छु। जुखुरेको बाबुलाइ

हिसाब मिलाउँ-मिलाउँ लाग्यो। उहिले बाबुले स्कुल जानुपर्दैन, हामी कुल्लीका छोरा-छोरीले के पढ्छस्! भन्दा भन्दै पनि उसले कालेबुङबाट आएको मास्टरसित दुइ किताब छिचोलेको थियो।

(क) छोराको नाम जुखुरे किन राखियो? पोक्ची को थिई?

(ख) चियाकमानमा काम गर्ने कुल्लीहरूको दिनचर्याबारे लेख्नुहोस्।

(ग) जुखुरेको बाबुले बोनस पाएमा के किन्ने इच्छा राखेको थियो? किन?

(घ) दर्शै, हाजिरा, गैरहाजिर, बर्खा, इच्छा — शब्दलाई प्रयोग गरेर अर्थपूर्ण वाक्य बनाउनुहोस्।

5. Translate into Nepali: 40

(a) I love children. On coming to Rastrapati Bhavan, I have met them sometimes through video conference and sometimes directly. After talking with them, I have formed an idea about their opinion and view points on different matters. We always bother about big issues, but quite often forget to pay attention to the smaller ones. On many occasions, their comments on these minor problems are such as to show how strong their power of comprehension. The problem lies with setting up of our precedence. Sitting in Delhi, it is felt perhaps nothing could be more serious an issue than this. But this big country has many states having different kinds of problems. When I talk to a farmer at a remote village and find how he tries to bring up his child with proper education, I feel amazed at the diversity of this vast country.

(b) So long we have tried to learn only one language in the main, English, besides the mother tongue. This has three-fold objects — earning our bread, intercourse with foreigners and acquisition of knowledge in various subjects. When Hindi will become the official language of the country, it will not be possible for us to earn our living with knowledge of English only. Hindi will be indispensable in government service and in profession like law. Conversation with the people of the other provinces of India also shall have to be carried on mainly in Hindi. But English must have to be learnt by those who would go in for higher education or like to keep in touch with all the countries of the world. No doubt, in future also many will be able to earn their living without learning Hindi; just as many do it now by agriculture, industry, trade and physical labour without learning English.

SANTALI LETTER WRITING, DRAFTING OF REPORT, PRÉCIS WRITING, COMPOSITION AND TRANSLATION

1. ᱚᱫᱚᱣᱟᱱᱤ ᱞᱮᱠᱷᱟᱱᱟ ᱠᱚᱢ (Write a Letter with 150 words) : 40

ᱯᱟᱹᱛᱟᱱ ᱯᱮᱫᱚ ᱥᱩ ᱵᱷᱟᱹᱥᱟ ᱢᱟᱹᱧᱤᱡᱟᱹᱱᱟᱹᱜᱮ ᱩᱞᱩᱢᱟᱹᱱᱟᱹᱜᱮ ᱞᱮᱠᱷᱟᱱᱟ ᱨᱮᱭᱟᱵᱟᱱᱚᱨ ᱠᱟᱹᱣᱟᱹᱫᱟ ᱠᱚᱨᱟᱱᱟᱹᱜᱮ ᱫᱚᱨᱟᱱ ᱞᱮᱠᱷᱟᱱᱟ ᱠᱚᱢᱱᱤᱭᱟᱹᱜᱮ ᱚᱫᱚᱣᱟᱱᱤ ᱞᱮᱠᱷᱟᱱᱟ ᱠᱚᱢ ᱯᱮᱫᱚ 150 ᱜᱚᱱᱚᱜᱮ ᱢᱟᱹᱡᱷᱤ ᱢᱮᱱᱟᱜᱼᱟ ᱠᱟᱱᱟᱢ ᱢᱮᱱᱟᱜᱼᱟ ᱾ (Answer any one question)

(a) ᱩᱨᱟᱹᱫᱩᱵᱟᱹᱵ ᱩᱱᱟᱹᱢᱩᱞᱟᱹᱱᱤᱭᱚ ᱥᱟᱨᱠᱟᱨᱟᱜᱮ ᱯᱟᱹᱛᱟᱱ ᱞᱮᱠᱷᱟᱱᱟ ᱢᱮᱱᱟᱜᱼᱟ-ᱱᱟ ᱾

(b) ᱜᱟᱱᱟ-ᱜᱩᱱᱤ-ᱚᱱᱟᱱᱤᱱᱟᱱᱮ ᱠᱟᱱᱤᱫᱟ ᱥᱟᱨᱠᱟᱨᱟᱜᱮ ᱩᱞᱩᱢᱟᱹᱱᱟᱹᱜᱮ ᱥᱟᱹᱠᱩ ᱢᱟᱹᱡᱷᱤ ᱾

(c) ᱯᱟᱹᱵᱤᱞᱤᱱᱟ ᱩᱱᱟᱹᱢᱩᱞᱟᱹᱱᱤᱭᱚ ᱥᱟᱨᱠᱟᱨᱟᱜᱮ ᱞᱮᱠᱷᱟᱱᱟ ᱚᱫᱚᱣᱟᱱᱤᱱᱟ ᱵᱚ ᱥᱟᱨᱠᱟᱨᱟᱜᱮ ᱩᱨᱩᱞᱟᱹᱱᱟ ᱾

2. ᱥᱟᱹᱠᱩᱜᱤᱧ ᱜᱟᱞᱚᱱᱟᱜᱮ (within 200 words only). 40

"ᱜᱚ ᱫᱟᱢᱱᱟᱭᱟ ᱡᱚ ᱢᱟᱨᱮᱭᱟᱹ ᱜᱚ ᱚᱰᱚᱣᱟ ᱩᱱᱟᱹᱢᱩᱞᱟᱹᱱᱤᱭᱟᱹ (ᱜᱚ ᱫᱟᱢᱱᱟᱭᱟ ᱩᱱᱟᱹᱜᱮ ᱩᱱᱟᱹᱢᱩᱞᱟᱹᱜᱮ ᱣᱟᱫᱟ ᱡᱚ ᱢᱟᱨᱮᱭᱟᱹ ᱜᱚ ᱩᱨᱩᱞᱟᱹ ᱯᱷᱚᱱᱟᱜᱮ ᱢᱚᱣᱚᱞᱟᱹᱱᱟ ᱜᱮᱫᱟ)" ᱾
— ᱫᱚᱣᱟ ᱵᱟᱱᱚᱞᱟᱹ ᱩᱱᱟᱹᱢᱩᱞᱟᱹᱱᱟ 02 200 ᱢᱟᱹᱡᱷᱤ. ᱢᱮᱱᱟᱜᱼᱟ ᱩᱨᱩᱞᱟᱹᱱᱟᱹᱜᱮ ᱞᱮᱠᱷᱟᱫᱟᱨᱮ ᱢᱟᱫᱟᱢᱟᱜᱮ ᱯᱮᱫᱚ ᱾

3. ᱜᱚᱲᱚ ᱵᱟᱱᱚᱞᱟᱹᱱᱟ ᱠᱚᱢ (Write a Precis of the following passage) : 40

ᱢᱟᱨᱮᱭᱟ ᱡᱚ ᱩᱱᱤᱢᱮᱞᱟᱹᱣᱟ ᱵᱚᱫᱚᱞᱟᱜᱮ ᱩᱱᱟᱜᱮ ᱣᱟᱨᱯᱟᱜᱮ ᱥᱟᱹᱠᱩ ᱵᱟᱱᱟᱭᱟ ᱾ ᱢᱟᱨᱮᱭᱟ ᱞᱟᱭ ᱢᱟᱨᱟᱣᱟᱭᱟ ᱡᱚ ᱣᱟᱨᱯᱟ ᱯᱮᱫᱚ ᱢᱟᱹᱧᱤᱡᱟᱹᱱᱟᱹᱜᱮ ᱵᱟᱱᱚᱞᱟᱹᱱᱟ ᱚᱱᱟᱹᱧᱟᱹᱨᱟᱭᱟ ᱾ ᱥᱮᱵᱟᱞᱟᱭᱟᱜᱮ ᱜᱮ ᱯᱮᱫᱚ ᱡᱚ ᱢᱟᱨᱟᱣᱟᱭᱟ ᱥᱟᱹᱠᱩ ᱨ ᱣᱟᱦᱟᱱᱟ ᱾ ᱢᱟᱨᱮᱭᱟ ᱩᱱᱟᱜᱮ ᱚᱱᱟᱹᱧᱟᱹᱨᱟᱭᱟᱜᱮ ᱯᱮᱫᱚ ᱡᱚ ᱩᱨᱩᱞᱟᱹᱨᱟᱭᱟᱜᱮ ᱥᱟᱹᱠᱩ ᱨ ᱣᱟᱦᱟᱱᱟ ᱾ ᱢᱟᱨᱮᱭᱟ ᱯᱮᱵᱟᱞᱟᱭᱟᱜᱮ ᱢᱟᱱᱟᱣᱟᱭᱟᱜᱮ ᱢᱟᱨᱮᱭᱟᱨ ᱥᱟᱹᱠᱩ ᱦᱩᱵᱟᱱᱟᱜᱮ ᱩᱱᱟᱜᱮ ᱚᱱᱟᱹᱧᱟᱹᱨᱟᱭᱟ, ᱵᱮ ᱩᱱᱟᱹᱵᱟ ᱯᱮᱫᱚ ᱢᱟᱨᱮᱭᱟ ᱨᱮ ᱢᱚᱛᱟᱱ ᱵᱩᱵᱩᱠ ᱯᱮᱫᱚ ᱯᱤᱱᱟᱜᱮ ᱩᱱᱟᱹᱢᱩᱞᱟᱹᱱᱟ ᱾ ᱨᱮᱭᱟᱵᱟᱱᱚᱨ ᱞᱮᱠᱷᱟᱱᱟ ᱥᱟᱹᱠᱩ ᱜᱮᱞᱟ ᱯᱷᱚᱱᱟᱜᱮ ᱢᱟᱨᱮᱭᱟ ᱢᱚᱛᱟᱱ ᱯᱮᱫᱚ ᱩᱨᱩᱞᱟᱹᱱᱟ ᱵᱩᱵᱩᱠ ᱵᱩᱵᱩᱠ ᱵᱟᱱᱟᱭᱟ ᱾ ᱚᱱᱟᱹᱧᱟᱹᱨᱟᱭᱟ ᱵᱚᱞᱚ ᱢᱟᱨᱮᱭᱟ ᱨᱮ ᱢᱚᱛᱟᱱ ᱵᱩᱵᱩᱠ ᱯᱮᱫᱚ ᱩᱨᱩᱞᱟᱹᱱᱟ ᱾ ᱢᱟᱨᱮᱭᱟ ᱞᱟᱭ ᱢᱟᱨᱟᱣᱟᱭᱟ ᱡᱚ ᱢᱟᱨᱮᱭᱟ ᱨᱮ ᱢᱚᱛᱟᱱ ᱵᱩᱵᱩᱠ ᱯᱮᱫᱚ ᱩᱨᱩᱞᱟᱹᱱᱟ ᱾ ᱢᱟᱨᱮᱭᱟ ᱵᱚᱞᱚ ᱢᱟᱨᱮᱭᱟᱨ ᱥᱟᱹᱠᱩ ᱦᱩᱵᱟᱱᱟᱜᱮ ᱩᱱᱟᱜᱮ ᱚᱱᱟᱹᱧᱟᱹᱨᱟᱭ

ᱩᱫᱟᱦᱚᱨᱚᱱ । ᱫᱚᱲᱚᱢ ᱛᱚᱱᱚᱠᱮᱫᱚᱢᱛᱮᱱᱟ ᱥᱚᱦᱚᱲ ᱢᱚᱱᱚ ᱢᱚᱱᱟᱜᱟᱱᱟᱜᱟᱱ ᱢᱚᱱᱚᱢᱚᱱᱚ ᱵᱚᱞᱚᱫᱚᱜᱮ ᱯᱷᱚᱞᱚᱣᱮ ᱩᱫᱚᱜᱚᱱᱚ ᱚᱱᱟ ᱩᱴᱮᱜᱮᱱᱚ ᱥᱚᱦᱚᱲᱮᱱᱚ । ᱡᱚᱲ ᱚᱴᱮᱜᱮᱱᱚ ᱩᱱᱤᱡᱟᱡᱚᱨ ᱵᱚᱱᱚᱫᱚᱲᱮ ᱯᱷᱚᱞᱚᱣᱮᱱ ᱢᱚᱱᱚᱢᱚᱱᱚ ᱢᱚᱱᱚᱢᱚᱱᱚ ᱵᱚᱞᱚᱫᱚᱜᱮ ᱯᱷᱚᱞᱚᱣᱮᱱ ᱢᱚᱱᱚᱢᱚᱱᱚ ᱵᱚᱞᱚᱫᱚᱜᱮ ᱯᱷᱚᱞᱚᱣᱮᱱ, ᱵᱚᱱᱚᱫᱚᱲᱮ ᱚᱱᱟ ᱢᱚᱱᱚᱢᱚᱱᱚ ᱵᱚᱞᱚᱫᱚᱜᱮ ᱯᱷᱚᱞᱚᱣᱮᱱ

(b) So long we have tried to learn only one language in the main, English, besides the mother tongue. This has three-fold objects — earning our bread, intercourse with foreigners and acquisition of knowledge in various subjects. When Hindi will become the official language of the country, it will not be possible for us to earn our living with knowledge of English only Hindi will be indispensable in government service and in profession like law. Conversation with the people of the other provinces of India also shall have to be carried on mainly in Hindi. But English must have to be learnt by those who would go in for higher education or like to keep in touch with all the countries of the world. No doubt, in future also many will be able to earn their living without learning Hindi; just as many do it now by agriculture, industry, trade and physical labour without learning English.

2005462

2023

ENGLISH LETTER WRITING, DRAFTING OF REPORT, PRÉCIS WRITING, COMPOSITION AND TRANSLATION

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

1. (a) Write a letter to the Additional District Magistrate (ADM) of your district requesting him to issue an Economically Weaker Section (EWS) certificate in favour of you. You have furnished all the necessary documents those are to be needed to issue the same. (Word limit: 150 words) 40

Or,

(b) You are an aspirant of civil service. Now, you would like to avail the coaching and the guidance provided at the Satyendranath Tagore Civil Services Study Centre (SNTCSSC), Saltlake, Kolkata.

Write a letter to the Chairman, SNTCSSC, expressing your wish to join the centre and to avail the library, hostel and other facilities provided there.

(The letter should be written within 150 words.) 40

2. Draft a report on 'Effect of Global Warming on Planate Earth', a Symposium organized by your college. (Within 200 words.) 40

3. Write a composition on any one of the following topics: 40

(a) National Education Policy (NEP) 2020: Highlights and Implimentations

(b) Kanyashree Project, a Govt. initiative: A model for woman empowerment and emancipation

(c) Ageing

(d) Literature and the representation of reality

4. Write a précis on the following and add a suitable title for it. 35+5

Shakespeare is the greatest manipulator of the English tongue in poetry and his popularity abroad would seem to contradict the generalization that is being made. It can , however, be truely said that Shakespeare, as all poets, loses much of his original force in translation, and the number of foreigners who have understood his language in all its innumerable associations is far less than those who have enjoyed the plays. He succeeds because, he is so good a dramatist that he remains alive even when the poetic element in his work has been distorted, or even destroyed. Further, his verse has often a meaning so well grounded in human experience that it retains interest even when translation has destroyed much of the original beauty of expression. Thus to quote a single example, Hamlet, at the end of the tragedy, says to Horatio, 'Absent thee from felicity awhile', a phrase which to English minds is of illimitable suggestion. Translate the construction and let Hamlet merely say, 'In memory of this tragedy refrain for a little while from pleasure and happiness', and he is still speaking good

sense though he has ceased to speak poetry. Or it may be that Hamlet in that final moment, his stress tragically resolved was referring to death itself as 'felicity'. Should this be the meaning the problem of translation still remains equally difficult.

5. Translate *any one* of the following passages into English: 40

(Who opted Bengali for Paper-I)

(a) বনে-জঙ্গলে ছোটো বড়ো কত রকমের জানোয়ার, আর তাদের অস্ত্রই বা কত রকমের। শিং, নখ, দাঁত, ক্ষুর— এক-একজনের এক-একটা চলে। এক-একজনের আবার মুখ ও পা দুই-ই চলে। যেমন, বাঘের দাঁত ও নখ, মহিষের শিং ও ক্ষুর, শুয়োরের দাঁত ও ক্ষুর। বনে-জঙ্গলে কত রকমের জানোয়ারই দেখেছি। কিন্তু শুয়োরের মতো এমন অদ্ভুত মেজাজের জীব আর দেখলাম না। বাঘ বল, ভাল্লুক বল, হাতি, মহিষ, গন্ডার সকলেই চলে অতি সাবধানে, অতি সন্তর্পণে, পাছে কেউ জানতে না পারে। দশ-বিশ ফুট দূর দিয়ে বাঘ-ভাল্লুক নিঃশব্দে পাশ কাটিয়ে চলে যায়, কিছু জানবার, কিছু বোঝবার জো নেই। হাতিটা পর্যন্ত এক-একসময়ে প্রায় ঘাড়ের উপর এসে না পড়লে আর বুঝতে পারা যায় না যে হাতি আসছে।

(b) যাইতে যাইতে তাহার মন পুলকে ভরিয়া উঠিতেছিল। সে কাহাকেও বুঝাইয়া বলিতে পারে না যে, সে কী ভালোবাসে এই মাটির তাজা রোদপোড়া গন্ধটা, এই ছায়াভরা দূর্বাঘাস, সূর্যের আলো মাখানো মাঠ, পথ, গাছপালা, পাখি, বনঝোপ, ওই দোলানো ফুলফলের থোলো, আলুকুশি, বনকলমি, নীল অপরাজিতা। ঘরে থাকিতে তাহার মোটেই ইচ্ছে হয় না, ভারি মজা হয় যদি বাবা তাহাকে বলে— খোকা, তুমি শুধু পথে পথে বেড়িয়ে বেড়াও, তাহা হইলে এইরকম বনফুল ঝুলানো ছায়াচ্ছন্ন ঝোপের তলা দিয়া ঘুঘু-ডাকা দূর বনের দিকে চোখ রাখিয়া এই রকম মাটির পথটি বাহিয়া শুধুই হাঁটে— শুধুই হাঁটে। মাঝে মাঝে হয়তো বাঁশবনের কঞ্চির ডালে শর্ শর্ শব্দ, বৈকালের রোদে সোনার সিঁদুর ছড়ানো আর নানা রঙ বেরঙ-এর পাখির গান।

Translate the Hindi passage into English (*any one*): 40

(Who opted Hindi in lieu of Bengali for Paper-I)

(a) अनुशासन की आबश्यकता हर स्थान पर औरहर क्षेत्र में है। व्यक्ति के निजी जीवन, सामाजिक जीवन और राश्ट्रीय जीवन सबमें इसका बड़ा महत्व है। जिस व्यक्ति के निजी जीवन में अनुशासन का अभाव होगा, उसे बार-बार विषम स्थितियों का सामना करना पड़ेगा। ऐसा व्यक्ति प्राय: अपने लक्ष्यों को पुरा कर पाने में असमर्थ रहेगा। समाज में भी ऐसे व्यक्ति को प्रतिष्ठा नहीं मिल पाती। अनुशासनहीन व्यक्ति अपने समाज की उन्नति में कोई योगदान नहीं कर सकता। वह समाज की प्रगति में बाधा और समाज के लिए बोझ भी बन सकता है। राष्ट्रीय जीवन में तो अनुशासन का सर्वाधिक महत्व है। जिस राष्ट्र के नागरिकों में अनुशासन होता है, वे बड़े-से-बड़े संकट को भी स्वाभिमान के साथ झेल लेते हैं। अनुशासनहीन नागरिकों वाला राष्ट्र एक अनियन्त्रित भीड़ जैसा होता है, जो काब कैसा आचरण करेगा, कोई नहीं बता सकता। व्यक्ति ही समाज और राष्ट्र की इकाई है। अत: जैसे व्यक्ति होंगे, वैसा ही उनका समाज और राष्ट्र होगा। किसी राष्ट्र या समाज के चरित्र का अध्ययन उसके नागरिकों को देखकर किया जा सकता है।

(b) राष्ट्रीय विकास परिषद् ने देश के किसानों और कारखानों में कार्य करने वाले मजदुरों से चतुर्थ पंचवर्षीय योजना को सफल बनाने में अधिक-से-अधिक सहयोग देने की अपील की है। देशवासियों के अनुशासित सहयोग और उनकी कर्तव्यपरायणता से योजना की विभिन्न मदों को सफलतापुर्नक पुरा किया जा सक्ता है। समाज के सभी वर्गों को इसके लिए सहयोग देना चाहिए। समाज में जिनकी आर्थिक स्थिति अच्छी हैं, उन लोगों से परिषद की ओर से कहा गया है कि उन्हें अपने व्यय पर संयम रखना चाहिए और अपने धन की बर्बादी को रोकना चाहिए तथा आपने व्ययों को कम

करने का प्रयत्न करना चाहिए। सभी देशवासियों को राष्ट्र और समाज के हितों की ओर अपने संकुचित हितों की अपेक्षा अधिक ध्यान देना चाहिए और ऐसा करने से वे निजी और राष्ट्र दोनों प्रकार के हितों को सुरक्षित करने में सफल हो सकेंगे। इस समय देश की जो स्थिति है, उससे देश की सुरक्षा की व्यवस्था का महत्व और भी बढ़ गया है। राष्ट्रीय योजना के सभी कार्यों को उक्त दृष्टि से देखा जाना चाहिए।

Translate the Urdu passage into English (*any one*): 40

(Who opted Urdu in lieu of Bengali for Paper-I)

(a) ہندوستانیوں کی اکثریت دیہات میں رہتی تھی اور غربت میں رہتی تھی۔ یہ رابندر ناتھ کا یقین تھا کہ ہندوستانی تعلیم دیہی زندگی کے بارے میں علم کے بغیر اور دیہی زندگی کو نئے سرے سے جوڑنے کی کوشش کے بغیر ادھوری ہوگی۔ اس لیے رابندر ناتھ کے نزدیک وشوابھارتی کے احساس کا ایک اہم پہلو مکمل سرگرمی تھی۔ دوسرا پہلو عالمگیریت، دنیا کی روح کی عکاسی کرتا ہے۔ سچ کی تلاش میں وشوابھارتی کا وشوابھارتی ہونا تھا کہ مشرق مغرب سے ملے گا۔ رابندر ناتھ کے لیے وشوابھارتی پوری دنیا کے لیے ملنے کا ایک گھونسلہ تھا۔ ''وشوابھارتی''، انہوں نے لکھا، ''ہندوستان کی تھی لیکن اسے تمام بنی نوع انسان کی روحانی کوششوں کا مرکز بنانا چاہیے''۔ یہ وشوابھارتی کا ایک اہم مطلب ہونا تھا۔ اس لحاظ سے ہم عام طور پر وشوابھارتی کو سمجھتے ہیں۔ لیکن یہ پوری طرح جان لیں کہ ہمیں شانتی نکیتن اور سری نکیتن کی تعلیم کو ایک ساتھ سمجھنا چاہیے، ان کے مجموعی طور پر یہ تعلیم کلاس روم کی حدود سے باہر زندگی سے قریبی تعلق رکھنے کی کوشش تھی۔ یہ کل سرگرمی کو سکھانا اور اس پر عمل کرنا تھا، دنیا کے لیے ایک جامع قبولیت پیدا کرنا، زندگی میں سالمیت اور سیکھنے میں وابستگی لانا تھا۔ رابندر ناتھ کا خیال تھا کہ اس قسم کی کوششوں سے قوم اپنا اعتماد بحال کرے گی اور عوام کی عزتِ نفس۔ اس کے لیے دو چیزیں ضروری تھیں، اس نے محسوس کیا۔ ہندوستان کا علم اور دنیا کے سیکھنے کے ساتھ ایک حقیقی ربط کی ضرورت ہے۔

(b) دوپہر کے کھانے کے بعد لائبریری میں۔ یہ ایک لائبریری سے زیادہ نہیں ہے۔ اس کے ادبی ساز و سامان میں پرانے کاغذ سے ڈھکے ہوئے ناول، ٹوٹے ہوئے پشتے، کافی کے داغ، پھٹے ہوئے انگوٹھوں سے سٹاک ایک ہی طے شدہ شیلف اور ان پر چند تختے کی کتابوں کے ساتھ چند چھوٹی لکی ہوئی شیلفیں شامل ہیں۔ دیوار کی باقی جگہ جنگ اور پیچھا کی ٹرافیوں کے قبضے میں ہے۔ لیکن یہ سب زیادہ آرام دہ بیٹھنے کا کمرہ ہے۔ تین بڑی کھڑکیوں کی ایک قطار ایک پہاڑی پینورما دکھاتی ہے، جو ابھی دوپہر کی ہلکی ہلکی روشنی میں اپنے دوستانہ پہلوؤں میں سے ایک میں نظر آتی ہے۔ دائیں ہاتھ کی کھڑکیوں کے ساتھ والے کونے میں، ایک مربع مٹی کا چولہا، چمکتے ہوئے برتنوں کا ایک بہترین ٹاور، تقریباً چھت پر چڑھتا ہے اور کافی حد تک گرمی کی ضمانت دیتا ہے۔ رائنا کے کمرے میں عثمانی ایسا ہی ہے اور اسی طرح رکھا ہوا ہے۔ اور کھڑکی کی سیٹیں سجے ہوئے کشن کے ساتھ پرتعیش ہیں۔ تاہم، ایک چیز ہے جو اپنے ارد گرد کے ماحول کو برقرار رکھنے سے باہر ہے۔ یہ کچن کی ایک چھوٹی سی میز ہے، جو پہننے کے لیے اس سے بھی زیادہ بدتر ہے، لکھنے کی میز کے طور پر نصب ہے جس میں قلم سے بھرا ہوا ایک پرانا ڈبہ، سیاہی سے بھرا ہوا انڈے کا کپ اور بہت زیادہ استعمال ہونے والے گلابی بلوٹنگ پیپر کا ایک افسوسناک سکریپ ہے۔

Translate the Nepali passage into English (*any one*): 40

(Who opted Nepali in lieu of Bengali for Paper-I)

(a) लक्ष्मीप्रसाद देवकोटाको जन्म १२ नवम्बर १९०९ मा काठमाडौंमा भएको थियो। उनका पिताको नाम तिलमाधव देवकोटा र माताको नाम अमर राज्यलक्ष्मी देवी थियो। उनले पहिलो कविता १० वर्षको उमेरमा लेखेका थिए। देवकोटा नेपाली साहित्य का विभिन्न विधामा कलम चलाउने बहुमुखी प्रतिभाशाली कवि हुन्। उनले कविता र निबन्ध विधामा गरेका योगदान उच्चकोटिको मानिन्छ। 'मुना मदन' उनको प्रसिद्ध कृति हो। भारतका साहित्यकार राहुल सांकृत्यायनले देवकोटालाई हिन्दी साहित्यका सुमित्रानन्दन पन्त, जयशंकर प्रसाद र सुर्यकान्त त्रिपाठी निरालासँग

तुलना गरेका छन्। लक्ष्मीप्रसाद देवकोटाको मृत्यु १४ सेप्टेम्बरमा १९५९ मा भएको हो।

(b) भारतीय इतिहासमा पहिलो महिला शिक्षिका र प्रधानाध्यापक, सावित्रीबाई फुलेलाई मनिन्छ। समाज सुधारक ज्योतिराव फुले र सावित्रीबाई फुलेले 1848 मा पुणेमा बालिकाहरुको विद्यालय खोले, त्यसपछि उनीहरुले 1851-52 मा थप दुईवटा विद्यालय खोले। 19 औं शताब्दीको उत्तरार्धमा, भारतमा बालिकाहरुको शिक्षा उल्लेखनीय रुपमा वृद्धि भएको पाइन्छ। 2011 को जनगणना अनुसार, भारतमा कुल साक्षरता दर 74.00 प्रतिशत छ र महिलाहरुको साक्षरता दर 65.46 प्रतिशत छ। महिला शिक्षित भएमा समाजमा उनीहरुको सकारात्मक पक्ष बाहिर आउँदछ र उनीहरु समाजको हरेक निर्णयमा सहभागी बन्न सक्छन्।

Translate the Santali passage into English (*any one*): 40

(Who opted Santali in lieu of Bengali for Paper-I)

(a) ᱥᱟᱱ.ᱨ ᱥᱟᱱᱛᱟᱞᱤ ᱯᱟᱹ.ᱨ ᱐ᱲ ᱜᱚᱜ ᱮᱢᱮᱜᱟᱱ ᱦᱩᱭᱩᱠᱚᱞᱟᱱ ᱛᱚᱞᱟᱭᱟᱱ.ᱜ-ᱱᱤ । ᱮᱱᱮᱛᱚᱱᱤᱯᱟ ᱪᱮᱫᱟᱱ ᱮᱫᱟᱜ 'ᱦᱟᱱᱮᱜᱟᱱᱚᱣᱟᱱᱟ' ᱢᱚᱛᱚᱠᱟᱱᱮ ᱱᱟᱱᱛᱟᱨᱮᱱ ᱚᱫᱮᱱᱟᱜ ᱣᱚᱜᱟᱨᱮ ᱢᱮᱱᱟᱱᱟᱜ-ᱱᱤ । ᱮᱱᱚᱣᱟᱱ ᱦᱟᱱᱮᱜᱟᱱᱚᱣᱟᱱᱟ ᱜᱚᱜ ᱮᱢᱮᱜᱟᱱ ᱦᱩᱭᱩᱠᱚᱞᱟᱱ ᱚᱫᱮᱱᱟᱜ ᱠᱚᱞᱟᱱ ᱠᱟᱹᱯᱤᱜ ᱚᱱᱟ'ᱣᱟ ᱦᱟᱱᱮᱱᱟ । ᱮᱱᱚᱠᱚ ᱩᱱᱤᱦᱚᱨᱩᱞᱮ ᱮᱢᱮᱜᱟᱱ ᱦᱩᱭᱩᱠᱚᱞᱟᱱ ᱚᱫᱮᱱᱟᱜ ᱵᱟᱞᱤᱠᱟᱦᱟᱨᱩᱠᱚ ᱦᱟᱱᱮᱛᱮ ᱜᱟᱞᱵᱟᱱ.ᱣᱟᱱᱟᱠᱯᱮᱫᱮᱱᱟ ᱱᱟᱹ ᱮᱱᱚᱣᱟᱱ ᱦᱩᱭᱩᱠᱚᱞᱟᱱ ᱚᱫᱮᱱᱟᱜ ᱢᱚᱛᱚᱠᱟ ᱜᱚᱜ ᱫᱟᱨᱤ ᱯᱟᱨᱥᱮᱫ ᱯᱮᱫᱮᱱᱟ । ᱣᱟᱱᱟᱱᱚᱣᱟᱱ ᱜᱟᱞᱮᱜᱟᱱ ᱮᱱᱮᱛᱚᱱᱤᱯᱟ ᱵᱟᱱᱚᱣᱮ ᱣᱟᱱᱟᱱᱟᱜᱮ ᱯᱮᱫᱮᱱᱟ, ᱮᱢᱮᱜᱟᱱ ᱦᱩᱭᱩᱠᱚᱞᱟᱱ ᱚᱫᱮᱱᱟᱜ ᱚᱨᱮᱱᱟᱱ ᱚᱱᱚᱦᱚᱱᱣ ᱯᱮᱫᱮᱱᱟ ᱢᱟᱨᱟᱜ ᱯᱟᱨᱥᱮᱫ ᱵᱟᱱᱚᱣᱮ ᱚᱫᱮᱱᱟᱜ ᱠᱚᱞᱟᱱ ᱠᱟᱹᱯᱤᱜ ᱚᱱᱟ'ᱣᱟ ᱦᱟᱱᱮᱱᱟ ᱮᱱᱮᱛᱚᱱᱤᱯᱟ ᱦᱩᱭᱩᱠᱚᱞᱟᱱ ᱚᱫᱮᱱᱟᱜ ᱠᱚᱞᱟᱱ ᱠᱟᱹᱯᱤᱜ ᱚᱱᱟ'ᱣᱟ ᱦᱟᱱᱮᱱᱟ ᱮᱱᱚᱠᱚ ᱚᱱᱟ'ᱣᱟ ᱠᱚᱞᱟᱱ ᱠᱟᱹᱯᱤᱜ ᱚᱱᱟ'ᱣᱟ ᱦᱟᱱᱮᱱᱟ ।

(b) ᱚ: ᱚᱨᱟᱣᱟᱜ ᱮᱱᱟᱣᱵ ᱮᱫᱟᱨᱟᱵ ᱚᱱ ᱱᱟᱹᱥᱱᱟᱞᱤᱵᱟᱱᱫᱮᱣ ᱚᱜᱮᱫᱚ ᱵᱮᱞᱮᱫ ᱮᱫᱟᱜ ᱜᱮᱫᱚᱨᱚᱱ ᱱᱟᱹᱨᱚᱱ ᱵᱮᱫᱮᱱᱟ ᱱᱚᱣᱚᱱ ᱵᱮᱫᱮᱱᱟ ᱩᱜᱟᱱᱫᱤᱱ ᱚᱫᱮᱱᱟᱜ ᱢᱤ.᱐ᱵ ᱵᱮᱫᱮ ᱛᱚ ᱱᱟᱵᱟᱜ ᱫᱚᱨᱮᱜ ᱮᱢᱮᱜᱟᱱ ᱱᱟᱹᱨᱚᱱ ᱵᱮᱫᱮᱱᱟ । ᱱᱟᱹᱱ ᱚᱨᱟᱣᱟᱜ ᱱᱚᱜ ᱠᱚᱞᱟᱱ ᱜᱚᱜ ᱜᱚᱜᱮᱫᱚᱨ ᱮᱱᱚᱣᱦᱚᱨᱩᱞᱮ ᱱᱟ ᱵᱟᱱᱟ ᱱᱚᱜ ᱱᱚᱜ ᱠᱚᱞᱟᱱ ᱜᱚᱜ ᱩᱱᱤᱨᱮᱱᱟᱜᱮ ᱜᱟᱹᱞᱚᱛᱟ । ᱩᱱᱤᱨᱮᱱᱟᱜᱮᱱ ᱜᱚᱜ ᱢᱟᱨᱟᱜ ᱮᱱᱮᱛᱚᱱᱤᱯᱟ ᱱᱚᱣᱚᱱ ᱵᱮᱫᱮᱱᱟ । ᱚᱫᱮᱱᱟᱜᱚ ᱚ: ᱚᱨᱟᱣᱟᱜ ᱮᱱᱟᱣᱵ ᱮᱫᱟᱨᱟᱵ ᱜᱚᱜ ᱜᱟᱹᱞᱚᱛᱟ. ᱵᱩᱡᱤ ᱵᱟᱱᱚᱣᱮ ᱜᱮᱫᱚ ᱱᱚᱣᱚᱱᱚᱣᱮ ᱜᱟᱹᱞᱚᱛᱟ. ᱵᱚ ᱮᱱᱚᱣᱚᱨ ᱜᱮᱱᱚᱨᱵᱟᱱᱚᱨᱮ ᱣᱟᱱᱟᱱᱟᱱᱚᱵᱟᱵ ᱱᱚᱵᱟᱱᱮᱱᱟ । ᱮᱱᱮᱛᱚᱱᱤᱯᱟ ᱯᱟᱱᱮᱨᱯᱟᱱᱵᱟᱱᱟ ᱚᱜ ᱱᱟ.ᱚᱨᱟ ᱚᱱᱟᱜᱮᱨᱮ ᱚᱨᱟᱣᱟᱜ ᱵᱮᱫᱮ ᱚᱱᱟ'ᱣᱟᱵᱟᱱᱮᱱᱟ ᱱᱟ ᱮᱱᱮᱛᱚᱱᱤᱯᱟ ᱩᱱᱟ.ᱮᱞᱟ ᱚᱜ ᱱᱚᱣᱟᱱ ᱜᱚᱜ ᱩᱱᱟ.ᱮᱞᱟ ᱯᱮᱵᱟᱱᱮᱨᱮ ᱣᱟᱱᱟᱱᱟ ᱱᱚᱵᱟᱱᱮᱱᱟ । ᱥᱟᱹᱨᱤ ᱮᱢᱮᱜᱟᱱ ᱛᱚ ᱵᱮᱞ ᱚᱜ ᱯᱮᱵᱟᱱᱮᱨᱮᱱᱟᱜ ᱱᱟᱹᱨᱚᱱ ᱱᱚᱣᱚᱱ ᱵᱮᱫᱮᱱᱟ ᱱᱚᱵᱟᱱᱮᱱᱟ । ᱮᱱᱮᱛᱚᱱᱤᱯᱟ ᱱᱟᱹ ᱣᱟᱨᱮᱜᱟ ᱜᱮᱫᱚᱨᱚᱱᱟᱱᱮᱱᱟ ᱩᱱᱟ.ᱮᱞᱟ ᱐ᱲᱮ ᱮᱢᱮᱜᱟᱱ ᱣᱮᱵᱚᱥᱟᱭᱴ ᱚᱜᱮᱫᱚᱨᱚᱱ ᱚ: ᱚᱨᱟᱣᱟᱜ ᱮᱱᱟᱣᱵ ᱮᱫᱟᱨᱟᱵ ᱜᱚᱜ ᱜᱮᱫᱚᱨᱚᱱᱟᱱᱮᱱᱟ ᱩᱱᱟ.ᱮᱞᱟ ᱐ᱲᱮ ᱮᱢᱮᱜᱟᱱ ᱨ ᱣᱟᱱᱚᱨᱮᱱ ᱦᱩᱭᱩᱠᱚᱞᱟᱱ । ᱯᱟᱱᱮᱨᱮᱱ ᱣᱟᱱᱚᱱᱤᱜ ᱚᱨᱟᱣᱟᱜ ᱮᱱᱟᱣᱵ ᱮᱫᱟᱨᱟᱵ ᱜᱚᱜ ᱢᱤᱨᱩᱜ ᱮᱢᱮᱜᱟᱱ ᱱᱟᱹᱨᱚᱱ ᱵᱮᱫᱮᱱᱟ ᱱᱚᱣᱚᱱ ᱵᱮᱫᱮᱱᱟ ᱩᱱᱤᱨᱮᱱᱟᱜᱮᱱ ᱩᱱᱤᱦᱤᱜ ᱦᱩᱭᱩᱠᱚᱞᱟᱱ ᱚᱫᱮᱱᱟᱜ ᱠᱚᱞᱟᱱ ᱠᱟᱹᱯᱤᱜ ᱚᱱᱟ'ᱣᱟ ᱦᱟᱱᱮᱱᱟ ।

MWC/III/23

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO.

2023

TEST BOOKLET

PAPER–III

Time allowed : 3 hours

Full marks : 200

Answer ***all*** the questions.

Questions are of equal value.

TEST BOOKLET SERIES

A

3005497

Serial No. .....

Roll No.:

Signature of the Candidate:

INSTRUCTIONS

Candidates should read the following instructions carefully before answering the questions:

1. This booklet consists of 24 pages including this front page, containing 200 questions. **Verify the Page Nos. and Test Booklet series on each page and bring at once to the Invigilator's notice any discrepancy.**
2. Answers will have to be given in the OMR Sheet supplied for the purpose.
3. Before you proceed to mark in the OMR Sheet in response to various items in the Test Booklet, you have to fill in some particulars in the OMR Sheet. ***Do not fold the OMR Sheet as this will result in error in your marks.***
4. All questions are of multiple-choice answer-type. You will find ***four*** probable answers **(A)**, **(B)**, **(C)** and **(D)** against each question. Find out which of the four answers appears to you to be **correct or the best.** Now darken the circle corresponding to the letter of the selected answer in the Answer-Sheet with **Black Ball Point Pen** as per instructions printed in the reverse **of the Admit Card** and in the Answer-Sheet.
5. One and only one circle is to be fully blackened for answer. Any spot in any other circle (multiple circle) or in wrong circle will be considered as wrong answer. If more circle is encoded for a particular answer, it will be treated as a wrong answer.
6. ***There will be negative marking of 0·25 mark for each wrong answer.***
7. ***There are blank pages at the end of this Booklet for Rough Work.***
8. ***The Special Answer-Sheet should be handed over to the Invigilator before leaving the Examination Hall. You are permitted to take away the used Test Booklet after completion of the examination.***

1. The duration of Tripartite Struggle was

(A) 200 years
(B) 100 years
(C) 400 years
(D) 50 years

2. Who was associated with the 'Sunset Law'?

(A) Lord Lytton
(B) Lord Ripon
(C) Lord William Bentinck
(D) Lord Cornwallis

3. Treaty of Purandar (1665) was concluded between

(A) Sivaji and Jay Singh.
(B) Tipu Sultan and English East India Company.
(C) English East India Company and Ranjit Singh.
(D) English East India Company and the Marathas.

4. In which year Vasco-da-gama arrived in Kalikat?

(A) 1757
(B) 1498
(C) 1497
(D) 1598

5. 'Mandalam' and 'Nadu' these two institutions were associated with

(A) the Pallavas
(B) the Cholas
(C) the Pandyas
(D) the Rashtrakutas

6. The Ryotwari System was first introduced in

(A) Bengal
(B) Delhi
(C) Madras
(D) Gujarat

7. Who was known as 'Parrot of India'?

(A) Tansen
(B) Surdas
(C) Amir Khusrau
(D) Abul Fazal

8. Which Mughal ruler took the title of Alamgir?

(A) Akbar
(B) Jahangir
(C) Shah Jahan
(D) Aurangzeb

9. Who was the President of Lahor Congress (1929)?

(A) Jawaharlal Nehru
(B) Subhas Chandra Bose
(C) Anandamohan Bose
(D) Ramesh Chunder Dutt

10. 'Battle of Ten Kings' was described in

(A) The Rig Veda.
(B) The Sama Veda.
(C) The Jajur Veda.
(D) The Atharva Veda.

11. Who was the first Indian ruler to accept the Subsidiary Alliance?

(A) The Nawab of Bengal
(B) The Nizam of Hyderabad
(C) The Nawab of Awadh
(D) Peshwa Balaji Baji Rao

12. Who composed 'Rajatarangini'?

(A) Kalhana
(B) Bilhana
(C) Banabhatta
(D) Ashvaghosha

13. Which Mughal ruler granted Diwani Rights of Bengal to the English East India Company?

(A) Farrukhsiyar
(B) Bahadur Shah Zafar
(C) Jahandar Shah
(D) ShahAlam II

14. Jizya was reimposed by

(A) Aurangzeb
(B) Shah Jahan
(C) Jahangir
(D) Bahadur Shah

15. Which dynasty ruled over Magadha before the Mauryan dynasty?

(A) Satavahana
(B) Sunga
(C) Nanda
(D) Kanva

16. When Gandhi–Irwin pact was signed?

(A) 1931
(B) 1930
(C) 1915
(D) 1919

17. Who was not the member of the Cabinet mission of 1946?

(A) Sir Henry lawrence
(B) Pethick lawrence
(C) Stafford Cripps
(D) A. V. Alexander

18. Fort William College was founded in

(A) 1800
(B) 1820
(C) 1850
(D) 1900

19. Who composed 'Nagananda' and 'Ratnabali'?

(A) Harshavardhana
(B) Kanishka
(C) Samudragupta
(D) Chandragupta II

20. The Swaraj Party was founded by

(A) Motilal Nehru and Bal Gangadhar Tilak.
(B) C. R. Das and Motilal Nehru.
(C) C. R. Das and Subhash Chandra Bose.
(D) Motilal Nehru and Sardar Vallabh Bhai Patel.

21. Who was associated with the Home Rule Movement in India?

(A) Aurobindo Ghosh
(B) Bal Gangadhar Tilak
(C) Madanmohan Malavya
(D) Mahatma Gandhi

22. 'Akbarnama' was composed by

(A) Mughal Emperor Akbar.
(B) Abul Fazal.
(C) Faizi.
(D) Bairam Khan.

23. Which Act was described as the 'Black Act' by Gandhiji?

(A) The Arms Act of 1878
(B) The Vernacular Press Act of 1878
(C) Rowlatt Act of 1919
(D) The Government of India Act of 1919

24. During Alexander's invasion who was the then ruler of Magadha?

(A) Dhanananda
(B) Chandragupta Maurya
(C) Puru
(D) Ambhi

25. Sati Act was passed in the year

(A) 1856
(B) 1829
(C) 1729
(D) 1929

26. Who composed the 'Buddhacharita'?

(A) Asvaghosa
(B) Basumitra
(C) Nagasena
(D) None of the above

27. Who was the founder of the Indian National Congress?

(A) Dadabhai Naoroji
(B) Mohandas Karam Chand Gandhi
(C) Lord Hardinge
(D) A. O. Hume

28. When the British Government transferred the capital from Kolkata to Delhi?

(A) 1911
(B) 1906
(C) 1910
(D) 1915

29. When Gandhiji gave his famous slogan 'Do or Die'?

(A) On the eve of the non-co-operation movement
(B) On the eve of the Civil Disobedience movement
(C) On the eve of the Rowlatt Satyagraha
(D) On the eve of the Quit India movement

30. Which Gupta ruler took the title of 'Vikramaditya'?

(A) Chandragupta I
(B) Samudragupta
(C) Chandragupta II
(D) Skandagupta

31. The Nasik inscription gives us information about

(A) The Bakatakas
(B) The Rastrakutas
(C) The Satavahanas
(D) The Guptas

32. Who started the Brahmo Samaj Movement?

(A) Dayananda Saraswati
(B) Raja Rammohan Roy
(C) Swami Vivekananda
(D) Mahadev Govinda Ranade

33. Indigo Rebellion took place in

(A) Bengal
(B) Andhra Pradesh
(C) Maharashtra
(D) Kerala

34. Newspaper the 'Bengalee' was founded by

(A) Womesh Chunder Bonnerjee.
(B) Bankim Chandra Chattopadhyay.
(C) Surendranath Bandopadhyay.
(D) Nabagopal Mitra.

35. Who was the leader of the Indigo revolt?

(A) Dudu Miyan
(B) Titumir
(C) Digambar Biswas
(D) Kanhu Murmu

36. Who was the first Viceroy of India?

(A) Lord Canning
(B) Lord Mountbatten
(C) Lord Clive
(D) Lord Auckland

37. Who was the leader of Santhal Rebellion?

(A) Sindhu Murmu
(B) Jyotiba Phule
(C) Birsa Munda
(D) Visnucharan Biswas

38. The Lucknow Pact (1916) was an agreement between

(A) Indian National Congress and Muslim League.
(B) Indian National Congress and the British Government.
(C) Muslim League and the British Government.
(D) Moderate Congress Extremist leaders and leaders of Indian National Congress.

39. The signatories of the Treaty of Basin (1802) were the English East India Company and

(A) the Sikhs.
(B) the Marathas.
(C) Nizam of Hyderabad.
(D) Tipu Sultan.

40. Hindu College was established in

(A) 1817
(B) 1812
(C) 1858
(D) 1885

Please Turn Over

41. Who came to Jahangir's Court ?

(A) Sir Thomas Roe
(B) Ibn Battuta
(C) Nuniz
(D) Domingo Paes

42. Which God was known as 'Purandar' to the Vedic people?

(A) Lord Siva
(B) Indra
(C) Baruna
(D) Agni

43. Who founded the Indian Association?

(A) Aurobindo Ghosh
(B) Surendranath Banerjee
(C) Bipin Chandra Pal
(D) Masterda Surya Sen

44. Who was the then Governor General of India at the time of the Great Revolt of 1857?

(A) Lord Canning
(B) Lord Carzon
(C) Lord Cornwallis
(D) Lord Minto

45. From which inscription we get important information about the Saka ruler Rudra Damana?

(A) Junagarh inscription
(B) Aihole inscription
(C) Allahabad Pillar inscription
(D) Bhitari Pillar inscription

46. Which was the Capital City of Magadha during the reign of Chandragupta Maurya?

(A) Amaravati
(B) Pataliputra
(C) Ujjain
(D) Kannauj

47. Who was the first Muslim President of Indian National Congress?

(A) Badruddin Tyabji
(B) M. A. Jinnah
(C) Ajmal Khan
(D) Abul Kalam Azad

48. The Simon Commission visited India in

(A) 1946
(B) 1928
(C) 1942
(D) 1930

49. Which of the following pair is not correct?

(A) Harishchandra Mukherjee – The Hindoo patriot
(B) Dinabandhu Mitra – Nildarpan
(C) Rabindranath Tagore – Gora
(D) Bankim Chandra Chattopadhyay – Ghore Baire

50. The Kailasanath temple in Kanchipuram was built by the

(A) Cholas
(B) Pallavas
(C) Pandyas
(D) Guptas

51. During the Arab invasion in 712AD the ruler of Sind was defeated by whom?

(A) Sultan Mahmud of Gazni
(B) Muhammad Ghori
(C) Muhammad-bin-Qasim
(D) Tajuddin Yildiz

52. Who was associated with the Theosophical Society in India?

(A) Sarojini Naidu
(B) Lakshmi Sahgal
(C) Padmaja Naidu
(D) Annie Besant

53. Who was known as the 'Frontier Gandhi'?

(A) Rashbehari Bose
(B) Mannabendranath Roy
(C) Barin Ghosh
(D) Khan Abdul Gaffar Khan

54. Which of the following pair is correctly matched?

(A) Jawaharlal Nehru – Ghore Baire
(B) Dadabhai Naoroji – Proverty and UnBritish rule in India
(C) Rabindranath Tagore – Anandamath
(D) Bankim Chandra Chattopadhyay – Discovery of India

55. Who invaded South India?

(A) Balban
(B) Iltutmish
(C) Qutb-ud-Din Aibak
(D) Alauddin Khilji

56. Who was the Last ruler of the Delhi Sultanate?

(A) Daulat Khan Lodi
(B) Ibrahim Lodi
(C) Alam Khan Lodi
(D) Jahandar Lodi

57. Who was not the member of the Congress Socialist Party?

(A) Jayaprakash Narayan
(B) Rammonohar Lohiya
(C) Firoz Shah Mehta
(D) Narendra Deva

58. First battle of Panipat took place in

(A) 1526
(B) 1528
(C) 1616
(D) 1626

59. Who was the author of the book 'Hind Swaraj'?

(A) Netaji Subhash Chandra Bose
(B) Jawaharlal Nehru
(C) Bal Gangadhar Tilak
(D) Gandhiji

60. The Vernacular Press Act was enacted by

(A) Lord Curzon
(B) Lord Ripon
(C) Lord Lytton
(D) None of the above

61. Who was a moderate nationalist leader?

(A) Lala Lajpat Rai
(B) Dadabhai Naoroji
(C) Bal Gangadhar Tilak
(D) Bipin Chandra Pal

62. Surat Split took place in

(A) 1900
(B) 1907
(C) 1911
(D) 1919

63. Which one is not true about the Poona Pact?

(A) The Poona Pact was an agreement between Mahatma Gandhi and Dr. B. R. Ambedkar.
(B) The Poona Pact was made in 1932.
(C) The Poona Pact was signed in Poona.
(D) By this agreement the point of separate electorate for the Hindus and the Muslims was accepted.

64. Who composed the 'Artha Sastra'?

(A) Kautilya
(B) Barahamihira
(C) Aryabhatta
(D) Patanjali

65. Third battle of Panipat took place in

(A) 1761
(B) 1740
(C) 1770
(D) 1707

66. Who was the general and successor of Muhammad Ghori?

(A) Muhammad-ibn-Bakhtyar
(B) Qutub-Uddin Aibak
(C) Tajuddin Yaldiz
(D) Nasiruddin

67. Chandragupta Maurya was a follower of

(A) Jainism
(B) Buddhism
(C) Ajivika religion
(D) Saivism

68. Ibadatkhana was founded by

(A) Akbar
(B) Jahangir
(C) Shah Jahan
(D) Aurangzeb

69. Which Governor General introduced the 'Doctrine of Lapse'?

(A) Lord Cornwallis
(B) Lord Dalhousie
(C) Lord Wellesley
(D) Lord Ripon

70. Which Mahajanapada of 6th century BCE was an aristocratic-oligarchic republic (a confederacy of eight clans governed in accordance with republican principles)?

(A) Magadha
(B) Vajji
(C) Kashi
(D) Koshala

71. Lothal is located at

(A) Rajasthan
(B) Uttar Pradesh
(C) Gujarat
(D) Hariyana

72. Balgangadhar Tilak was the editor of the newspaper—

(A) The Bande Mataram
(B) The Maratha
(C) The Enquirer
(D) The Hindu Patriot

73. Who had Nine Jewels in his royal court?

(A) Chandragupta II
(B) Samudragupta
(C) Chandragupta I
(D) Chandragupta Maurya

74. Who was the first president of Indian National Congress (1885)?

(A) Womesh Chunder Bonnerjee
(B) Baba Saheb Vimrao Ambedkar
(C) Firoz Shah Mehta
(D) Sardar Vallabhbhai Patel

75. Who among the following Viceroys ridiculed the Indian National Congress as 'representing only a microscopic minority of people'?

(A) Lord Canning
(B) Lord Elgin
(C) Lord Lawrence
(D) Lord Dufferin

76. Who composed the 'Vikramankadevacharita'?

(A) Bilhana
(B) Ravikirti
(C) Banabhatta
(D) Kalhana

77. The Yusufzai revolt took place during the reign of

(A) Shahjahan
(B) Akbar
(C) Aurangzed
(D) Jahangir

78. During which Governor General's reign, the partition of Bengal was declared in 1905?

(A) Lord Curzon
(B) Lord Wellesley
(C) Lord Amherst
(D) Lord William Bentinck

79. Montague Chelmsford Reform was introduced in

(A) 1909
(B) 1929
(C) 1919
(D) 1900

80. Which was the nerve centre of the Quit India movement in Medinipur of Bengal?

(A) Garbeta
(B) Tamluk
(C) Kanthi
(D) Haldia

81. Who won the first battle of Tarain?
(A) Prithviraj Chauhan
(B) Muhammad Ghori
(C) Muhammad-bin-Qasim
(D) Sultan Mahmud of Ghazni

82. In which year the Queen's Proclamation was issued?
(A) 1855
(B) 1859
(C) 1800
(D) 1858

83. Who introduced 'Kabuliyat' and 'Patta'?
(A) Shivaji
(B) Ashoka
(C) Sher Shah
(D) Akbar

84. Who appointed the Amini Commission?
(A) Lord Cornwallis
(B) Lord Dalhausie
(C) Lord Warren Hestings
(D) Lord Minto

85. Who founded the 'Khudai Khidmatgar'?
(A) Md Ali Jinnah
(B) Salimullah
(C) Saiyad Brothers
(D) Khan Abdul Gaffar Khan

86. Who composed the 'Milind Panho'?
(A) Vasumitra
(B) Nagasena
(C) Asvaghosa
(D) Dharmakirti

87. The capital of the Pallava rulers was
(A) Hampi
(B) Dwarka
(C) Kanchipuram
(D) Ujjain

88. The third annual conference of the Indian National Congress was held in
(A) Bombay
(B) Lucknow
(C) Calcutta
(D) Madras

89. The School of Gandhara Art flourished during the reign of the
(A) Mauryan Dynasty.
(B) Kushan Dynasty.
(C) Satavahana Dynasty.
(D) Gupta Dynasty.

90. Which ancient Indian ruler was the Chief Patron of the fourth Buddhist Council?
(A) Ashoka
(B) Kanishka
(C) Ajatashatru
(D) Samudragupta

91. Which Gupta ruler saved the Gupta Empire from the invasion of the Hunas?

(A) Skandagupta
(B) Budhagupta
(C) Tathagata Gupta
(D) Vishnu Gupta

92. Who was the founder of the 'Servants of India Society'?

(A) Madanmohan Malavya
(B) Sardar Vallabhbhai Patel
(C) Subhash Chandra Bose
(D) Gopal Krishna Gokhale

93. What is the meaning of the word 'Gadar'?

(A) Freedom
(B) Rebel
(C) Revolt
(D) Patriot

94. Who composed the book 'Tahqiq-i-Hind'?

(A) Al Beruni
(B) Al Masudi
(C) Khafi Khan
(D) Hasan Nizami

95. Who was the author of the book 'Muntakhab –ul–Tawarikh'?

(A) Nizam-ud-din
(B) Amir Khusrau
(C) Faizi
(D) Badauni

96. Who reformed the revenue system during the rule of Akbar?

(A) Raja Maan Singh
(B) Birbal
(C) Todarmal
(D) Jai Singh

97. Nadir Shah invaded India in

(A) 1708
(B) 1688
(C) 1739
(D) 1750

98. Who composed 'Khazain-ul-Futooh'?

(A) Amir Khusrau
(B) Hasan Nizami
(C) Khafi Khan
(D) Abdal-Qadir Badayuni

99. Which one was known as the 'All White Commission'?

(A) The Hunter Commission
(B) The Linlithgo Commission
(C) The Simon Commission
(D) The Fowler Commission

100. Who was a famous artist of Akbar's Court?

(A) Basawan
(B) Bebadal Khan
(C) Ravi Barma
(D) Minhaj us-Siraj

101. _____ is the leading producer of wind energy in India.

(A) Gujarat
(B) Tamil Nadu
(C) Maharashtra
(D) Rajasthan

102. Which is the largest freshwater lake in India?

(A) Wular Lake
(B) Loktak Lake
(C) Dal Lake
(D) Naini Lake

103. Which river flows through the Valley of Kashmir?

(A) Chenab
(B) Ravi
(C) Sutlej
(D) Jhelum

104. Kaimur peak is situated in the

(A) Satpura ranges.
(B) Vindhyachal ranges.
(C) Aravalli ranges.
(D) Rajmahal hills.

105. Which Indian state is known as the "Spice Garden of India"?

(A) Kerala
(B) Karnataka
(C) Tamil Nadu
(D) Andhra Pradesh

106. Kunur is a tributary of which river?

(A) Ajay river
(B) Kangsabati river
(C) Mayurakshi river
(D) Rupnarayan river

107. Raka is the tributary of

(A) Brahmaputra.
(B) Mahanadi.
(C) Ganga.
(D) Krishna.

108. According to the Census of India, 2011; in West Bengal, the highest sex ratio was found in the district of

(A) Hooghly.
(B) Darjeeling.
(C) Birbhum.
(D) Murshidabad.

109. Which is the largest port in India by total cargo handled?

(A) Chennai Port
(B) Jawaharlal Nehru Port
(C) Mumbai Port
(D) Visakhapatnam Port

110. Which state in India is known for its unique 'Living Root Bridges'?

(A) Nagaland
(B) Mizoram
(C) Meghalaya
(D) Manipur

111. Which of the following rivers lies in a rift valley?

(A) Luni
(B) Chambal
(C) Son
(D) Tapi

112. Bongaon and Kolkata is connected by

(A) NH 31
(B) NH 34
(C) NH 06
(D) NH 35

113. H.G. Champion classified India's vegetation into

(A) 120 types.
(B) 116 types.
(C) 110 types.
(D) 200 types.

114. Which Indian city is known as the "City of Lakes"?

(A) Udaipur
(B) Bengaluru
(C) Nainital
(D) Srinagar

115. Arrange the following horizontal divisions of Himalayas according to west to east.

(1) Nepal Himalayas
(2) U.P. Himalayas
(3) Himachal Himalayas
(4) Kashmir Himalayas
(5) Assam Himalayas

(A) (4) (3) (2) (1) (5)
(B) (3) (4) (1) (2) (5)
(C) (1) (2) (3) (4) (5)
(D) (2) (1) (4) (3) (5)

116. Which Indian city is known for its diamond cutting and polishing industry?

(A) Jaipur
(B) Surat
(C) Ahmedabad
(D) Hyderabad

117. How many climatic regions Koppen divided India?

(A) 6
(B) 7
(C) 9
(D) 10

118. Kolleru lake is situated in

(A) Andhra Pradesh.
(B) Tamil Nadu.
(C) Kerala.
(D) Karnataka.

119. Coal deposition of tertiary period is found in

(A) Maharashtra and Odisha.
(B) Jharkhand and Bihar.
(C) Assam and Rajasthan.
(D) Madhya Pradesh and Andhra Pradesh.

120. Which of the following is the oldest part of the Himalayas?

(A) Middle Himalayas
(B) Greater Himalayas
(C) Lower Himalayas
(D) Transhimalayas

121. Lepcha tribe of Sikkim belongs to _____ stock.

(A) Proto-Australoid
(B) Australoid
(C) Mongoloid
(D) Negrito

122. Which region is referred to as the "Apple State of India"?

(A) Uttarakhand
(B) Jammu & Kashmir
(C) Sikkim
(D) Himachal Pradesh

123. Aeroplane engine is manufactured in

(A) Koraput.
(B) Kolkata.
(C) Visakhapatnam.
(D) None of the above

124. Which Indian state has the largest forest cover by area?

(A) Madhya Pradesh
(B) Arunachal Pradesh
(C) Chhattisgarh
(D) Maharashtra

125. Which state in India has the largest coastline?

(A) Kerala
(B) Tamil Nadu
(C) Andhra Pradesh
(D) Gujarat

126. Mount Abu, a pilgrimage of Jainism is situated in

(A) Guru Shikhar.
(B) Mt. Maikal.
(C) Kaimur range.
(D) Dodabeta.

127. Which mountain pass connects Leh in Ladakh to Srinagar in Kashmir Valley?

(A) Zojila Pass
(B) Nathula Pass
(C) Rohtang Pass
(D) Shipki La Pass

128. Which one of the following States has got highest literacy rate on the basis of 2011 Census?

(A) Mizoram
(B) Manipur
(C) Kerala
(D) Tripura

129. Which river is the main source of water for the Nagarjuna Sagar Dam?

(A) Krishna
(B) Godavari
(C) Cauvery
(D) Tungabhadra

130. Which district in West Bengal is known for its terracotta temples?

(A) Bankura
(B) Malda
(C) Birbhum
(D) Jalpaiguri

131. Which river flows through the city of Lucknow?

(A) Ganga
(B) Yamuna
(C) Saryu
(D) Gomti

132. Tilpara irrigation canal is situated in

(A) Birbhum.
(B) Purulia.
(C) Malda.
(D) None of the above

133. Where was India's first cement factory located?

(A) Bhadravati
(B) Sindary
(C) Chennai
(D) Dalmianagar

134. The Patkai Bum range makes the boundary between

(A) India and China.
(B) India and Bangladesh.
(C) India and Myanmar.
(D) India and Bhutan.

135. Which mountain peak is known as the "Savage Mountain"?

(A) K2
(B) Kanchenjunga
(C) Nanga Parbat
(D) Annapurna

136. Which Indian city is known as the headquarters of the Eastern Railway Zone?

(A) Patna
(B) Kolkata
(C) Guwahati
(D) Bhubaneswar

137. Which Indian state is known for its matrilineal society where lineage and inheritance are traced through the female line?

(A) Kerala
(B) Karnataka
(C) Meghalaya
(D) Odisha

138. In which state the first commercial rubber plantation in India was established?

(A) West Bengal
(B) Tamil Nadu
(C) Kerala
(D) Karnataka

139. Mettur hydroelectric project is located in

(A) Andhra Pradesh.
(B) Tamil Nadu.
(C) Kerala.
(D) Karnataka.

140. Which institution played a leading role in the dissemination of Green Revolution technologies in India?

(A) Indian Council of Agricultural Research (ICAR)
(B) Food Corporation of India (FCI)
(C) National Bank for Agriculture and Rural Development (NABARD)
(D) International Rice Research Institute (IRRI)

141. Which is the highest peak in the Western Ghats?

(A) Dodabeta
(B) Mahendragiri
(C) Anaimudi
(D) Mullayanagiri

142. Panna Mine is famous for

(A) Diamond
(B) Silver
(C) Coal
(D) Gold

143. In which of the following area Milam glacier is located?

(A) Himachal Himalayas
(B) Kumaon Himalayas
(C) Kashmir Himalayas
(D) Assam Himalayas

144. Which scheme aims at promoting entrepreneurship among women and SC/ST communities?

(A) Startup India
(B) Standup India
(C) Skill India
(D) Make in India

145. Which is the oldest mountain railway in India that is a UNESCO World Heritage Site?

(A) Konkan Railway
(B) Darjeeling Himalayan Railway
(C) Nilgiri Mountain Railway
(D) Kalka-Shimla Railway

146. Which is the longest dam in India?

(A) Hirakud dam
(B) Bhakra Nangal dam
(C) Nagarjuna Sagar dam
(D) Sardar Sarovar dam

147. Haldia Petrochemical LTD. (HPL) was established in which year?

(A) 1992
(B) 1984
(C) 1974
(D) 1988

148. The Salt Lake Didwana is situated in

(A) Punjab.
(B) Rajasthan.
(C) Gujarat.
(D) Odisha.

149. Which project is aimed at making India a global manufacturing hub by encouraging both multinational and domestic companies to manufacture their products in India?

(A) Make in India
(B) Digital India
(C) Skill India
(D) Startup India

150. Sugarcane is grown highest in which of the following states of India?

(A) Bihar
(B) Uttar Pradesh
(C) Madhya Pradesh
(D) Tamil Nadu

151. Density of population in India according to 2001 Census is

(A) 340 persons/sq. km.
(B) 370 persons/sq. km.
(C) 324 persons/sq. km.
(D) 380 persons/sq. km.

152. Which iron and steel plant was established in India with the cooperation of the Germany?

(A) Durgapur
(B) Bhilai
(C) Rourkela
(D) Bokaro

153. Kol dam is constructed on the

(A) Gandak river.
(B) Beas river.
(C) Sutlej river.
(D) Bagmati river.

154. The Konkan Coast stretches between _____ and _____ states.

(A) Gujarat, Goa
(B) Maharashtra, Kerala
(C) Goa, Kerala
(D) Maharashtra, Goa

155. Which of the following islands is made due to volcanic eruption?

(A) Narcondam
(B) Lakshadweep
(C) Minicoy
(D) All of the above

156. The Tropic of Cancer passes through which of the following districts of West Bengal?

(A) Murshidabad
(B) Birbhum
(C) Nadia
(D) Malda

157. The "Jaldapara National Park" is famous for _____ animal.

(A) Asiatic lion
(B) Indian rhinoceros
(C) Snow leopard
(D) Bengal tiger

158. Who is known as the "Father of Indian Railways"?

(A) Sir Syed Ahmed Khan
(B) Sir M. Visvesvaraya
(C) Lord Dalhousie
(D) Jawaharlal Nehru

159. Which scheme aims at promoting the use of solar energy for irrigation purpose in agriculture?

(A) PM-KUSUM
(B) PMFBY
(C) PKVY
(D) eNAM

160. Which one of the following states of India has the highest area under forest?

(A) Odisha
(B) Himachal Pradesh
(C) Arunachal Pradesh
(D) Assam

161. In which part of India is the Silent Valley National Park located?

(A) Tamil Nadu
(B) Kerala
(C) Karnataka
(D) Andhra Pradesh

162. Which island in the Andaman and Nicobar group is famous for its active volcano?

(A) Barren Island
(B) Ross Island
(C) Neil Island
(D) Havelock Island

163. Which river crosses the Tropic of Cancer twice?

(A) Mahi
(B) Mahananda
(C) Narmada
(D) Chambal

164. Kunzum pass is located in

(A) Sikkim.
(B) Himachal Pradesh.
(C) Uttarakhand.
(D) None of the above

165. Sanjay – Dubri Tiger Reserve is located in

(A) Tamil Nadu.
(B) Assam.
(C) Goa.
(D) Madhya Pradesh.

166. Which Indian state is the largest producer of coffee?

(A) Kerala
(B) Tamil Nadu
(C) Karnataka
(D) Andhra Pradesh

167. Which state has the highest percentage of scheduled tribes in India?

(A) Odisha
(B) Madhya Pradesh
(C) Chhattisgarh
(D) Mizoram

168. The "Gateway of India" monument is located in which city?

(A) Mumbai
(B) Kolkata
(C) Chennai
(D) Delhi

169. Alpine forest in India occur at the height between

(A) 4000 – 5000 meters
(B) .3000 – 4000 meters
(C) 2000 – 3000 meters
(D) None of the above

170. Sindhi Language belongs to

(A) Southern-Aryan Language Group.
(B) East-Aryan Language Group.
(C) Central-Aryan Language Group.
(D) North-Western Aryan Language Group.

171. Which city is known as the 'Silk City' of West Bengal?

(A) Asansol
(B) Durgapur
(C) Murshidabad
(D) Siliguri

172. Nokrek is the highest peak of

(A) Garo hills.
(B) Khasi and Jaintia hills.
(C) Rajmahal hills.
(D) None of the above

173. The East Calcutta Wetlands have been declared as a

(A) Biosphere Reserve.
(B) Reserve Forest.
(C) Ramsar Site.
(D) National Park.

174. Paradip and Mormugao Sea Ports of India are situated on the

(A) West coast.
(B) East coast.
(C) West and East coast respectively.
(D) East and West coast respectively.

175. Which state in India has the highest population density in 2011 census?

(A) Maharastra
(B) West Bengal
(C) Bihar
(D) Uttar Pradesh

176. Serampore, Belgharia and Sodepur are known for

(A) Paper Industry.
(B) Textile Industry.
(C) Sugar Industry.
(D) Iron and Steel Industry.

177. Match the following:

List-I (Wildlife Sanctuary)	List-II (Location)
I. Kanha	(1) Assam
II. Periyar	(2) Kerala
III. Madumalai	(3) Madhya Pradesh
IV. Manas	(4) Tamil Nadu

	I.	II.	III.	IV.
(A)	(3)	(2)	(1)	(4)
(B)	(1)	(2)	(3)	(4)
(C)	(3)	(2)	(4)	(1)
(D)	(4)	(3)	(2)	(1)

178. Which is the largest brackish water lake in India?

(A) Chilika Lake
(B) Pulicat Lake
(C) Vembanad Lake
(D) Loktak Lake

179. Khadar soil is found in

(A) Flood plain.
(B) Foot hill.
(C) Piedmont plain.
(D) All of the above

180. Which Indian state is famous for the Dachigam National Park?

(A) Himachal Pradesh
(B) Uttarakhand
(C) Jammu & Kashmir
(D) Sikkim

181. In which of the following states black soil is not found?

(A) Maharashtra
(B) Andhra Pradesh
(C) Gujarat
(D) West Bengal

182. Who is known as the "Father of the Green Revolution in India"?

(A) Dr. Verghese Kurien
(B) Dr. M. S. Swaminathan
(C) Dr. Norman Borlaug
(D) Dr. A. P. J. Abdul Kalam

183. According to the 2011 Census, which Indian state has the highest proportion of elderly people (aged 60 and above)?

(A) Tamil Nadu
(B) Kerala
(C) Punjab
(D) Maharashtra

184. Which is the highest peak in West Bengal?

(A) Sandakphu
(B) Singalila
(C) Tiger Hill
(D) Darjeeling peak

185. What is the significance of the Farakka Barrage in West Bengal?

(A) Hydroelectric power generation
(B) Flood control
(C) Navigation and irrigation
(D) Drinking water supply

186. Khetri Copper Belt is located in the state of

(A) West Bengal.
(B) Jharkhand.
(C) Rajasthan.
(D) Madhya Pradesh.

187. Swarnajayanti Gram Swarozgar Yojana was launched in the year

(A) 2005
(B) 1993
(C) 1999
(D) 2002

188. Which of the following rivers does not make delta?

(A) Tapi
(B) Cauvery
(C) Godavari
(D) Krishna

189. In which year the first industrial policy was declared?

(A) 1948
(B) 1956
(C) 1960
(D) 1962

190. Which district in West Bengal is known for the production of the 'Gobindobhog' variety of rice, which has a GI tag?

(A) Purba Medinipur
(B) Bankura
(C) Bardhaman
(D) Murshidabad

191. In which state of India Toda tribes are found?

(A) Tamil Nadu
(B) Bihar
(C) Sikkim
(D) Jharkhand

192. Which mountain pass connects India with Tibet and is located in Arunachal Pradesh?

(A) Nathu La
(B) Rohtang Pass
(C) Bomdi La
(D) Lipulekh Pass

193. The Jog Falls are situated on which river?

(A) Tapi river
(B) Saravathi river
(C) Cauvery river
(D) Bhima river

194. Which state is the largest producer of bauxite in India?

(A) Jharkhand
(B) Odisha
(C) Chhattisgarh
(D) Maharashtra

195. Which state in India has the lowest population according to the 2011 Census?

(A) Sikkim
(B) Mizoram
(C) Arunachal Pradesh
(D) Goa

196. Which state has the largest number of districts in India?

(A) Uttar Pradesh
(B) Maharashtra
(C) Bihar
(D) Madhya Pradesh

197. The Aravalli Range stretches across which states in India?

(A) Rajasthan, Gujarat and Haryana
(B) Rajasthan, Gujarat and Madhya Pradesh
(C) Rajasthan, Gujarat and Maharashtra
(D) Rajasthan, Gujarat and Uttar Pradesh

198. Which organization is responsible for formulating and enforcing economic policy in India?

(A) Ministry of Finance
(B) Ministry of Commerce and Industry
(C) NITI Aayog
(D) Planning Commission

199. Which of the following groups is not correct?

(A) Ram Ganga Multipurpose Project — Madhya Pradesh
(B) Shivasamudram Project — Karnataka
(C) Hirakund Project — Odisha
(D) Nagarjuna Sagar Project — Andhra Pradesh

200. Which is the source of the Son river?

(A) Maikal hills
(B) Amarkantak hills
(C) Kaimur hills
(D) Rajmahal hills

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO.

2023

TEST BOOKLET

PAPER - IV

Time allowed : 3 hours

Full marks : 200

Answer ***all*** the questions.

Questions are of equal value.

TEST BOOKLET SERIES

A

4005497

Serial No. .....

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Signature of the Candidate:

INSTRUCTIONS

Candidates should read the following instructions carefully before answering the questions:

1. This booklet consists of 24 pages including this front page, containing 200 questions. **Verify the Page Nos. and Test Booklet series on each page and bring at once to the Invigilator's notice any discrepancy.**
2. Answers will have to be given in the OMR Sheet supplied for the purpose.
3. Before you proceed to mark in the OMR Sheet in response to various items in the Test Booklet, you have to fill in some particulars in the OMR Sheet. ***Do not fold the OMR Sheet as this will result in error in your marks.***
4. All questions are of multiple-choice answer-type. You will find ***four*** probable answers **(A)**, **(B)**, **(C)** and **(D)** against each question. Find out which of the four answers appears to you to be **correct or the best**. Now darken the circle corresponding to the letter of the selected answer in the Answer-Sheet with **Black Ball Point Pen** as per instructions printed in the reverse **of the Admit Card** and in the Answer-Sheet.
5. One and only one circle is to be fully blackened for answer. Any spot in any other circle (multiple circle) or in wrong circle will be considered as wrong answer. If more circle is encoded for a particular answer, it will be treated as a wrong answer.
6. ***There will be negative marking of 0·25 mark for each wrong answer.***
7. ***There are blank pages at the end of this Booklet for Rough Work.***
8. ***The Special Answer-Sheet should be handed over to the Invigilator before leaving the Examination Hall. You are permitted to take away the used Test Booklet after completion of the examination.***

SE

1. Powndal is a unit of
(A) mass
(B) weight
(C) momentum
(D) energy

2. Who is called the 'Father of Green Revolution' in India?
(A) Verghese Kurien
(B) M S Swaminathan
(C) Dhyan Chand
(D) Vikram Sarabhai

3. Which of the following carbohydrates is not a monosaccharide?
(A) Glucose
(B) Fructose
(C) Ribose
(D) Lactose

4. Who is called the 'Father of Election Science'?
(A) David Butler
(B) T. N. Seshan
(C) Abul Kalam Azad
(D) Sukumar Sen

5. When the power of eye lens increases, the defect of vision is produced. The defect is known as
(A) shortsightedness
(B) longsightedness
(C) colour blindness
(D) astigmatism

6. Which of the following is the most suitable material for making permanent magnet?
(A) Steel
(B) Soft iron
(C) Copper
(D) Nickel

7. A magnetic field can be produced by
(A) moving charge.
(B) a changing electric field.
(C) both (A) and (B)
(D) None of the above

8. An astronaut in a spaceship see the outer space as
(A) Red
(B) Blue
(C) Indigo
(D) Black

9. The National Inland Navigation Institute is situated in which of the following places ?
(A) Patna
(B) Balasore
(C) Bangalore
(D) Dehradun

10. The first geostationary satellite launched in 1964 was called
(A) ANIK
(B) SYNCOM-3
(C) WESTAR
(D) MOLNIYA

11. Graphite is a good conductor of electricity due to
(A) strong electrostatic bonding.
(B) free localized bonds.
(C) free delocalized electrons.
(D) tetrahedral arrangement of particles.

12. The year in which NCEPC was set up is
(A) 1970
(B) 1972
(C) 1974
(D) 1980

13. Which of the following is a naturally occurring polymer?
(A) Starch
(B) Teflon
(C) Neoprene
(D) Nylon

14. Fullerene is made up of_____carbon atoms
(A) 100
(B) 20
(C) 75
(D) 60

15. The 10% law was provided by
(A) Odum
(B) Lindemann
(C) Tausley
(D) Darwin

16. Where is the COP 28 scheduled to be held?
(A) India
(B) Dubai
(C) USA
(D) Japan

17. The following organism does not exhibit sexual reproduction :
(A) Bacteria
(B) Cyanobacteria
(C) Fungi
(D) Algae

18. World Earth Day is celebrated on
(A) 2nd May
(B) 22nd April
(C) 20th March
(D) 28th February

19. Gahirmatha Sanctuary is the only sanctuary for _____ in Odisha.
(A) Turtles
(B) Crocodiles
(C) Elephants
(D) Deer

20. The range of visible spectrum is
(A) 350 - 650 nm
(B) 380 - 750 nm
(C) 390 - 700 nm
(D) 400 - 800 nm

21. The number of United Nations Sustainable Development Goals are

(A) 15
(B) 16
(C) 17
(D) 18

22. Stone cancer occurs due to

(A) Frost damage
(B) SPM
(C) Acid Rain
(D) Higher VOC level

23. The WSSD was held in

(A) Johannesberg
(B) Brazil
(C) London
(D) Paris

24. Minamata disease is caused by

(A) Lead
(B) Mercury
(C) Cadmium
(D) Arsenic

25. The HQ for CPCB is located in

(A) Mumbai
(B) Kolkata
(C) New Delhi
(D) Bangalore

26. Who among the following made first Film Theatre of India?

(A) Lumiere Brothers
(B) Mani Sethna
(C) Dada Saheb Phalke
(D) Dhirendra Nath Ganguly

27. Vinegar is a dilute solution of

(A) ethyl alcohol
(B) acetic acid
(C) formic acid
(D) vanadium

28. What was the capital of Vajji Mahajanapada?

(A) Kushinara
(B) Vaishali
(C) Pava
(D) Shuktimati

29. The internal energy of gas due to adiabatic expansion will be

(A) decreased
(B) increased
(C) same
(D) dissipiated

30. Probiotics are

(A) cancer inducing microbes
(B) safe antibiotics
(C) new kind of food allergens
(D) live microbial food supplement

31. The following layer is also called the hot layer of the atmosphere :

(A) Troposphere
(B) Stratosphere
(C) Mesosphere
(D) Thermosphere

32. Where is the global seed vault located ?

(A) Switzerland
(B) Norway
(C) Finland
(D) Denmark

33. Which one of the following is not a metalloid?

(A) Boron
(B) Silicon
(C) Gallium
(D) Germanium

34. When is the 'World Intellectual Property Day' observed?

(A) April 24
(B) April 26
(C) April 28
(D) April 30

35. The following organism helps in denitrification :

(A) Fungi
(B) Bacteria
(C) Algae
(D) Protozoa

36. Silent Valley Movement occurred in

(A) Tamil Nadu
(B) Karnataka
(C) Andhra Pradesh
(D) Kerala

37. Which of the following is a vector quantity?

(A) Current
(B) Current density
(C) Power
(D) Wattless current

38. UNDP HeadQuarters is located in

(A) New york
(B) Geneva
(C) London
(D) Paris

39. How many biosphere reserves are there in India in 2023?

(A) 17
(B) 18
(C) 19
(D) 20

40. Lumbar vertebrae are found in

(A) Abdominal region
(B) Thorax
(C) Neck region
(D) Hip region

41. The highest global warming potential is observed in

(A) CO_2
(B) NO_2
(C) CFC
(D) SF_6

42. Lichen is extremely sensitive to

(A) SO_2
(B) CO_2
(C) CO
(D) N_2

43. The year in which WHO was established is

(A) 1940
(B) 1948
(C) 1952
(D) 1954

44. The positive temperature coefficient of resistance is for

(A) Carbon
(B) Germanium
(C) Copper
(D) An electrolyte

45. Water is disinfected with

(A) $KMnO_4$
(B) Cl_2
(C) Both
(D) NO_2

46. Which is the largest tennis stadium in the world?

(A) Arthur Ashe Stadium
(B) 02 Arena Stadium
(C) Rotterdam Ahoy Stadium
(D) Perth Arena Stadium

47. BOD increases in a waterbody due to the increase of

(A) Phytoplankton
(B) Zooplankton
(C) Sewage
(D) Heavy Metals

48. GATT was introduced in

(A) 1947
(B) 1948
(C) 1954
(D) 1960

49. The coldest layer of the atmosphere is

(A) Troposphere
(B) Stratosphere
(C) Mesosphere
(D) Thermosphere

50. Toptapani is located in

(A) Uttar Pradesh
(B) Odisha
(C) Madhya Pradesh
(D) Jharkhand

51. The primary organ affected by COVID 19 is

(A) Lung
(B) Liver
(C) Kidney
(D) Spleen

52. The size of the nanoparticles between_____nm.

(A) 100 to 1000
(B) 0.1 to 10
(C) 1 to 100
(D) 0.01 to 1

53. Pablo Picasso was a famous painter from which country?

(A) USA
(B) France
(C) Spain
(D) UAE

54. Minamata Bay is located in

(A) North Korea
(B) China
(C) South Korea
(D) Japan

55. The frequency of a simple pendulum is f. What is the frequency change in the energy of the pendulum?

(A) $\frac{f}{2}$
(B) f
(C) 2f
(D) 4f

56. Which is the first Indian documentary to win an Oscar Award?

(A) Stranger at the Gate
(B) How do you Measure a Year?
(C) The Elephant Whisperers
(D) All that Breathes

57. The direction of induced e.m.f. during electromagnetic induction is given by

(A) Faraday's Law.
(B) Lenz's Law.
(C) Maxwell's Law.
(D) Ampere's Law.

58. Who is known as the father of the modern Olympic Games?

(A) Woodrow Wilson
(B) Pierre de Coubertin
(C) Spyridon Samaras
(D) Herbert Hoove

59. What is the order of increasing energy of the orbitals within a single energy level?

(A) $d < s < f < p$
(B) $s < p < d < f$
(C) $p < s < f < d$
(D) $f < d < p < s$

60. The size of E.Coli bacteria is

(A) 2000 nm.
(B) 200 nm.
(C) 20 nm.
(D) 2nm.

61. There are _____ districts in North Bengal.

(A) 8
(B) 7
(C) 6
(D) 5

62. Which institution won the '2021 Indira Gandhi Prize for Peace, Disarmament and Development'?

(A) Children For You
(B) Pratham
(C) Vanavil
(D) Give India Foundation

63. The element that is required for the synthesis of chlorophyll is

(A) Mn
(B) Fe
(C) Mg
(D) Mo

64. Which of the following beach is also known as Mahatma Gandhi Beach ?

(A) Marari beach
(B) Cherai beach
(C) Kollam beach
(D) Kannur beach

65. Competitive Exclusion Principle was denoted by

(A) Darwin
(B) Gause
(C) Lamarck
(D) Odum

66. A soap bubble is given a negative charge, then its radius

(A) decreases
(B) increases
(C) remains unchanged
(D) nothing can be predicted as information is insufficient

67. One of the following liquids will leave behind a residue on heating. This one is

(A) Brine
(B) Bromine
(C) Mercury
(D) Alcohol

68. Which species does not contain at least one 90° bond angle?

(A) CF_4
(B) PF_5
(C) SF_6
(D) SiF_6^{2-}

69. Fixed torque is applied to a body. What will be generated in the body?

(A) Angular acceleration
(B) Linear acceleration
(C) Angular velocity
(D) Angular displacement

70. Cyclotron is a device which is used to

(A) measure the charge
(B) measure the voltage
(C) accelerating electrons
(D) accelerating protons

71. The colour of CuS is
(A) Black
(B) Blue
(C) Yellow
(D) Red

72. The degrees of freedom of H_2 molecule is
(A) 2
(B) 3
(C) 5
(D) 6

73. Who among the following made the first fully indigenous silent feature film in India?
(A) Lumiere Brothers
(B) Mani Sethna
(C) Dada Saheb Phalke
(D) Dhirendra Nath Ganguly

74. Who was recently crowned as 'Miss India 2023'?
(A) Nandini Gupta
(B) Megan Edward
(C) Shreya Poonja
(D) Strela Luwang

75. The valley of flowers is located in which state of India?
(A) Uttar Pradesh
(B) Uttarakhand
(C) Sikkim
(D) Arunachal Pradesh

76. Which transitions are studied by UV spectrometer?
(A) Rotational
(B) Electronic
(C) Nuclear
(D) Vibrational

77. Which documentary won the "Best Long Documentary Award" at the South Asian Film Festival of Montreal 2023?
(A) Gujarat
(B) Scam
(C) Bharat Mata Ki
(D) Gauri

78. Which movie has been declared the best Indian film of all time by the International Federation of Film Critics (FIPRESCI)?
(A) Pather Panchali
(B) Ankur
(C) Anand
(D) Mughal-E-Azam

79. Noise in temperature of Sun compared to Earth is more than_____K.
(A) 1000
(B) 500
(C) 5000
(D) 1,00,000

80. 'Country Partnership Framework' is associated with which institution?
(A) World Bank
(B) IMF
(C) WEF
(D) ADB

81. Reaction of Lead Oxide (PbO) and hydrogen gas (H_2) leads to

(A) reduction of lead.
(B) oxidation of lead.
(C) formation of $PbCl_2$.
(D) formation of PbO.

82. Liberica excelsa, which was seen in the news, belongs to which species?

(A) Tea
(B) Coffee
(C) Rice
(D) Wheat

83. The Fukushima Nuclear disaster took place in

(A) 2010
(B) 2011
(C) 2012
(D) 2014

84. Netaji Subhas Chandra Bose became the Supreme Commander of Indian National Army in

(A) 1932
(B) 1935
(C) 1945
(D) 1943

85. What was the launch date of Chaiidrayaan-3?

(A) 24 July, 2023
(B) 14 July, 2023
(C) 13 July, 2023
(D) 04 July, 2023

86. Vocal Cords occur in

(A) pharynx
(B) larynx
(C) glottis
(D) bronchial tube

87. Law of definite proportion is obeyed in

(A) Stoichiometry
(B) electrometry
(C) photometry
(D) spectrometer

88. Triglycerides are broken down to

(A) Fatty acids
(B) Amino acids
(C) Glycerol
(D) Fatty acid and glycerol

89. OTEC involves thermal power generation from

(A) Sea
(B) River
(C) Wetland
(D) Lake

90. The Paithan (Jayakwadi) Hydro-electric project, completed with the help of Japan, is on the river—

(A) Godavari
(B) Narmada
(C) Cauvery
(D) Ganga

91. The down link frequency in the C-band transponder is

(A) 2 GHz
(B) 4 GHz
(C) 14 GHz
(D) 11 GHz

92. Which company has retained its spot as the top-selling car-maker in World for third straight year?

(A) Volkswagen
(B) Toyota
(C) Skoda
(D) None of the above

93. The nitrogen fixation in a paddy field is brought about by

(A) Bacteria
(B) Fern
(C) Cyano bacteria
(D) Algae

94. A television (TV) transmission is an example of which type of transmission?

(A) Simplex
(B) Half-duplex
(C) Full-duplex
(D) Bidirectional

95. Which Indian has won the 2023 Ramon Magsaysay Award?

(A) Ravi Kannan
(B) Gautam Adani
(C) Ghazal Alagh
(D) Kailash Vidyarthi

96. An n-type semiconductor is

(A) negatively charged.
(B) positively charged.
(C) neutral.
(D) negatively or positively charged depending upon the amount and substance of impurity.

97. What is the revised prize amount for Nobel Prize Winners, as of 2023?

(A) 1 million Swedish crowns
(B) 11 million Swedish crowns
(C) 21 million Swedish crowns
(D) 31 million Swedish crowns

98. The usual pH of sea water ranges from

(A) 7.5 – 8.5
(B) 8.5 – 9.5
(C) 9.5 – 10.5
(D) 10.5 – 11.5

99. The damage induced by PAN is

(A) Skin cancer
(B) Eye irritation
(C) Both
(D) Liver cancer

100. The Electrostatic Precipitator is ideally used for the removal of which type of pollution?

(A) Outdoor Air pollution
(B) Indoor Air pollution
(C) Water pollution
(D) Odour pollution

101. At constant temperature, the graph between P (pressure) vs $\frac{1}{V}$ (V=volume) of a real gas is

(A) hyperbola
(B) parabola
(C) circle
(D) straight line

102. Magnetic effect of current was discovered by

(A) Faraday
(B) Oersted
(C) Ampere
(D) Bohr

103. The following Hepatitis virus is transmitted through blood.

(A) Hep. A
(B) Hep. B
(C) Hep. C
(D) (B) and (C)

104. The best quality coal is

(A) Anthracite
(B) Peat
(C) Bituminous
(D) Lignite

105. World's 1st medicine from marijuana is named as

(A) Malarone
(B) Effexor
(C) Absinthium
(D) Epidolex

106. How many awards were won by West Bengal Government in the Scotch Governance Awards in 2021?

(A) 3
(B) 4
(C) 5
(D) 6

107. Which state is the largest producer of bamboo in India?

(A) Assam
(B) Arunachal Pradesh
(C) Chhatishgarh
(D) Karnataka

108. Which among the following part of Bombay (now Mumbai) is known as Old Woman's Island?

(A) Parel
(B) Worli
(C) Colaba
(D) Mazgao

109. The least albedo is noted in case of

(A) Soil
(B) Snow
(C) Asphalt
(D) Forest

110. Which scheme of West Bengal Government was awarded in the Digital India Mission.

(A) Shashthya Sathi
(B) Shilpa Sathi
(C) Rupashree
(D) Duare Sarkar

111. Alec Jeffery's name is associated with
(A) DNA sequencing
(B) DNA fingerprinting
(C) RNA sequencing
(D) Site directed mutagenesis

112. The shape of the Diminishing Age Pyramid is
(A) Triangular
(B) Bell-shaped
(C) Urn-shaped
(D) None of these

113. The following ecosystem develops in flowing water :
(A) Lentic
(B) Lotic
(C) Benthic
(D) Pelagic

114. What is the name of world's first robotic check-in assistant, that was launched by Emirates?
(A) Sara
(B) Kiwi
(C) Siri
(D) Rini

115. What is the name of the first female robot to be part of India's first manned space mission?
(A) Sangha mitra
(B) Ganga mitra
(C) Vyom mitra
(D) Gagan mitra

116. UNCED was held in
(A) Rio
(B) Stockholm
(C) Oslo
(D) London

117. Jadugoda mines are famous for
(A) iron ore.
(B) mica deposits.
(C) gold deposits.
(D) uranium deposits.

118. What do we see at speedometer of a car?
(A) Average speed
(B) Average velocity
(C) Instantaneous speed
(D) Instantaneous velocity

119. The main objective(s) of industrial robot is to
(A) minimize the labour requirement.
(B) increase the productivity.
(C) enhance the life of production machines.
(D) All of the above

120. Which type of modulation is employed in India for radio transmission?
(A) Amplitude modulation
(B) Frequency modulation
(C) Pulse modulation
(D) Phase modulation

121. The latest Biosphere Reserve in India is
(A) Nilgiri
(B) Andaman and Nicobar
(C) Gulf of Mannar
(D) Panna

122. In 2006, Nobel Prize for RNA Interference Phenomenon was won on the work carried out on
(A) D. melanogaster
(B) A. thalliana
(C) C. Elegans
(D) S. Pombe

123. Which theorem law can explain the working principle of sprayer?
(A) Stoke's law
(B) Bernoulli's theorem
(C) Jurin's law
(D) Virial theorem

124. Which radioactive metal is responsible for Chernobyl accident?
(A) Radioactive Uranium
(B) Radioactive Coesium
(C) Radioactive Plutonium
(D) Radioactive Polonium

125. Sultan Azlan Shah Cup is related to which among the following sports?
(A) Badminton
(B) Hockey
(C) Table Tennis
(D) Golf

126. We keep food in refrigerator to prevent food from going bad due to
(A) viral infection.
(B) fungal infection.
(C) bacterial infection.
(D) both (B) and (C)

127. Kuno National Park is situated in
(A) Madhya Pradesh
(B) Chattisgarh
(C) Gujarat
(D) Uttarakhand

128. When is the first paper mill established in India?
(A) 1832
(B) 1849
(C) 1857
(D) 1861

129. ISRO launched sounding rocket for atmospheric studies. What is the name of the rocket?
(A) Car to Sat
(B) Agni-IV
(C) RH 300
(D) Brahmos-ll

130. Which is not a constituent of cell membrane?
(A) Glycolipids
(B) Phospholipids
(C) Cholesterol
(D) Proline

131. Which book was written by Kalhana?
(A) Harshacharita
(B) Arthashastra
(C) Indika
(D) Rajatarangini

132. "The Last Ethic" is a book written by
(A) Leopold
(B) Carson
(C) Hardin
(D) White

133. Pressure within the lungs is called
(A) Inter-pulmonary pressure.
(B) Intra-pulmonary pressure.
(C) Interstitial pressure.
(D) Alveolar pressure.

134. Which sport's regional form is "Pehlwani"?
(A) Boxing
(B) Football
(C) Wrestling
(D) Badminton

135. 'Baibhav, Saurav and Gaurav' are the civilian awards provided by which state?
(A) Tamil Nadu
(B) Assam
(C) Odisha
(D) Jharkhand

136. Which structure has delocalized π electrons?
(A) O_3
(B) Co
(C) HCN
(D) CO_2

137. Which one of the following is more elastic
(A) Copper
(B) Rubber
(C) Sponze
(D) Steel

138. Who launched the Krishi Vikas Yojana
(A) Indian Council for Agricultural Research
(B) National Development Council
(C) State Bank of India
(D) State Agricultural Research Board

139. In a charged capacitor, the energy resides in
(A) positive charges.
(B) both positive and negative charges.
(C) the field between the plates.
(D) around the edge of the plates.

140. Who is the only living Indian to win the Grammy Award thrice?
(A) A R Rahman
(B) Ricky Kej
(C) Resul Pookutty
(D) Babbu Mann

141. The Global Warming Potential of CO_2 is
(A) 1
(B) 2
(C) 3
(D) 4

142. At which of the following places, noon sun shines exactly overhead twice a year?
(A) Digha
(B) Patna
(C) Kanpur
(D) Delhi

143. The following antibiotic is produced by bacteria :
(A) Penicillin
(B) Chloramphenicol
(C) Bacitracin
(D) Streptomycin

144. Boron is useful for which of the following organ?
(A) Liver
(B) Kidney
(C) Brain
(D) Bones

145. Which of the following states shares the longest boundary with China ?
(A) Sikkim
(B) Uttarakhand
(C) Himachal Pradesh
(D) Arunachal Pradesh

146. A 220 volt A.C. is more dangerous than 220 volt D.C. because
(A) the A.C. attracts.
(B) the D.C. repels.
(C) the body offers less resistance to A.C.
(D) peak voltage for A.C. is much larger than 220 volt.

147. X-unit = ?
(A) 10^{-15}m
(B) 10^{-12}m
(C) 10^{-10}m
(D) 10^{-13}m

148. Which one of the following is most likely to exhibit Tyndall effect?
(A) Sugar and water mixture
(B) Potash alum and water mixture
(C) Chalk powder and water mixture
(D) Potassium permanganate and water mixture

149. In which year, the first Women's Cricket World Cup was held?
(A) 1971
(B) 1972
(C) 1973
(D) 1974

150. Which of the following was the first made indigenous, coloured film in India ?
(A) Alama Ara
(B) Pather Panchali
(C) Kisan Kanya
(D) Devdas

151. 'Big Ben' is the famous clock located in which country?

(A) USA
(B) UK
(C) Australia
(D) France

152. The percentage of thermal power generated from coal in India at present is

(A) 50%
(B) 57%
(C) 64%
(D) 74%

153. The OTEC plant in India is located in

(A) Andaman and Nicobar Island
(B) Lakshadweep
(C) Gujarat
(D) Odisha

154. Which of the following tribes of Uttarakhand is mainly associate themselves with sheep rearing?

(A) Boksha
(B) Bhotia
(C) Raji
(D) Tharu

155. Maximum application of animal cell culture technology today is in the production of

(A) Insulin
(B) Interferons
(C) edible Proteins
(D) vaccines

156. Alternating current is transmitted to distant places at

(A) high voltage and low current.
(B) high voltage and high current.
(C) low voltage and low current.
(D) low voltage and high current.

157. Nor'wester in Assam is known as by which of the following name ?

(A) Andhi
(B) Mango Shower
(C) Bordoisila
(D) Blossom

158. The following vitamin is produced in human body due to exposure to sunlight:

(A) Vit B_6
(B) Vit B_1
(C) Vit C
(D) Vit D_3

159. Which among the following sectors used maximum commercial energy in India?

(A) Household sector
(B) Agriculture
(C) Industry
(D) Transport

160. Deposit of Lithium has been found in which Indian state?

(A) Ladakh
(B) Punjab
(C) Gujarat
(D) Jammu & Kashmir

161. The Rowlatt Act was passed in
(A) 1905
(B) 1913
(C) 1919
(D) 1925

162. Reindeer moss is actually a member of
(A) Algae
(B) Fungi
(C) Bryophyte
(D) Lichen

163. Ecology was coined by
(A) Haeckel
(B) Odum
(C) Tausley
(D) Darwin

164. What is the source of UV radiation?
(A) Hydrogen gas discharge lamp
(B) RF oscillator
(C) Klystron oscillator
(D) Nernst filament

165. Which of the following Indian states does not share boundary with Myanmar ?
(A) Assam
(B) Manipur
(C) Nagaland
(D) Arunachal Pradesh

166. Hormone secretin is produced by
(A) Stomach
(B) Liver
(C) Intestine
(D) Pancreas

167. The Principle of Controlled Chain Reaction is used in
(A) atom bomb.
(B) atomic energy reactor.
(C) the core of sun.
(D) artificial radioactivity.

168. Water purity is denoted by the absence of
(A) CO_2
(B) CO
(C) Coliform
(D) Entero bacter

169. What is the frequency of supply A.C. (current) in India?
(A) 220 Hz
(B) 60 Hz
(C) 50 Hz
(D) 40 Hz

170. Which Indian was conferred the UNEP 'Champions of the Earth' Award in 2022?
(A) Purnima Devi Barman
(B) Narendra Modi
(C) K. K. Shailaja
(D) Piyush Goyal

171. For which novel Nayantara Sahgal was awarded Sahitya Academy Award for English?
(A) A Time to be Happy
(B) The Day in Shadow
(C) Rich Like Us
(D) None of the above

172. Who is the author of the book "India After Gandhi The History of the World's Largest Democracy"?
(A) Madhav Gandhi
(B) Romila Thapar
(C) Ramachandra Guha
(D) Sujit Mukherjee

173. The first transgenic plant was produces
(A) Rice
(B) Tobacco
(C) Maiz
(D) Cotton

174. These days HFC is replaced by which gas in refrigerator?
(A) Toluene
(B) Butane
(C) Isobutane
(D) Nitrobenzene

175. Who was the founder of Haryanka dynasty in India?
(A) Bimbisara
(B) Ajatashatru
(C) Harshabardhana
(D) Ghanananda

176. IAEA looks after the safety for which type of pollution?
(A) Heavy Metals
(B) Hydro carbon
(C) Plastic
(D) Radio active elements

177. Which Greek Ruler sent Megasthenes in the Court of Chandragupta Mourya?
(A) Seleucas Nicator
(B) Antiochus
(C) Ptolemy
(D) None of the above

178. Which of the following gases causes the formation of Carlamino haemoglobin?
(A) CO
(B) CO_2
(C) NO_2
(D) SO_2

179. The NDRF is under which Ministry?
(A) Ministry of Home Affairs
(B) Ministry of Environment and Forest
(C) Ministry of External Affairs
(D) Ministry of New and Renewable Energy

180. Which of the following phenomena is not common to sound and light waves?
(A) Interference
(B) Diffraction
(C) Polarisation
(D) reflection

181. A non-volatile solid is added to water. Its boiling point will

(A) decrease.
(B) increase.
(C) not change.
(D) not to be predicted.

182. When light is refracted, which of the following does not change?

(A) Wavelength
(B) Frequency
(C) Velocity
(D) Amplitude

183. How many major forest groups are there in India?

(A) 3
(B) 4
(C) 5
(D) 6

184. The state in India having the highest number of wind mill is

(A) Karnataka
(B) Gujarat
(C) Tamil Nadu
(D) Kerala

185. The average temperature of the Earth due to the albedo effect is

(A) 10°C
(B) 15°C
(C) 20°C
(D) 25°C

186. Which one of the following is a novel by Rabindranath Tagore?

(A) Jagir
(B) Durgeshnandini
(C) Gora
(D) Ganadevata

187. What is the India's first nuclear reactor?

(A) RAMBHA
(B) MENAKA
(C) URVASI
(D) APSARA

188. What is the name of antibiotics that has been discovered to help in fighting drug resistant or hard-to-treat bacterial infections?

(A) Philo habdins
(B) Odilor habdins
(C) Oli habdins
(D) Ozor habdins

189. What is the amount of methane in cow dung?

(A) 30%
(B) 40%
(C) 50%
(D) 60%

190. The use of living microorganism to degrade environmental pollutants is called

(A) microremediation.
(B) nanoremediation.
(C) bioremediation.
(D) All of the above

191. Which launcher was used for Chandrayaan-3?

(A) GSLV
(B) LVSM
(C) GSLV-MK 3
(D) PSLV

192. Which component is absent in animal cell membrane?

(A) Cholesterol
(B) Ergosterol
(C) Phospholipid
(D) Oligosaccharide

193. In which year Asoka invaded Kalinga?

(A) 261 BC
(B) 235 BC
(C) 275 BC
(D) 251 BC

194. Artemesin is a drug used in

(A) Dengue
(B) Malaria
(C) Typhoid
(D) Pertussis

195. Quantity that remains unchanged in a transformer is

(A) Voltage
(B) Current
(C) Frequency
(D) Current density

196. The water which is available to plant roots is

(A) Gravitational water.
(B) Chemically combined water.
(C) Hygroscopic water.
(D) Capillary water.

197. Which was the India's first talkie film?

(A) Alama Ara
(B) Pundlik
(C) Raja Harishchandra
(D) Nal Damayanti

198. Who is the author of the book "The Idea of India"?

(A) Sunil Khilnani
(B) Kiran Nagarkar
(C) Shiv K Kumar
(D) None of the above

199. The maximum height of Troposphere from the Earth's surface is

(A) 10 Km
(B) 12 Km
(C) 14.5 Km
(D) 16.8 Km

200. Which sport's competition was known as the "Friends Provident Trophy"?

(A) Football
(B) Volleyball
(C) Squash
(D) Cricket

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO.

2023

TEST BOOKLET

Paper-V

Time allowed : 3 hours

Full marks : 200

Answer ***all*** the questions.

Questions are of equal value.

TEST BOOKLET SERIES

A

Serial No. 5005497 .....

Roll No.:

Signature of the Candidate:

INSTRUCTIONS

Candidates should read the following instructions carefully before answering the questions:

1. This booklet consists of 24 pages including this front page, containing 200 questions. **Verify the Page Nos. and Test Booklet series on each page and bring at once to the Invigilator's notice any discrepancy.**
2. Answers will have to be given in the OMR Sheet supplied for the purpose.
3. Before you proceed to mark in the OMR Sheet in response to various items in the Test Booklet, you have to fill in some particulars in the OMR Sheet. ***Do not fold the OMR Sheet as this will result in error in your marks.***
4. All questions are of multiple-choice answer-type. You will find ***four*** probable answers **(A)**, **(B)**, **(C)** and **(D)** against each question. Find out which of the four answers appears to you to be **correct or the best**. Now darken the circle corresponding to the letter of the selected answer in the Answer-Sheet with **Black Ball Point Pen** as per instructions printed in the reverse **of the Admit Card** and in the Answer-Sheet.
5. One and only one circle is to be fully blackened for answer. Any spot in any other circle (multiple circle) or in wrong circle will be considered as wrong answer. If more than one circle is encoded for a particular answer, it will be treated as a wrong answer.
6. ***There will be negative marking of 0·25 mark for each wrong answer.***
7. ***There are blank pages at the end of this Booklet for Rough Work.***
8. ***The Special Answer-Sheet should be handed over to the Invigilator before leaving the Examination Hall.You are permitted to take away the used Test Booklet after completion of the examination.***

1. The original Constitution of India had how many Articles and Schedules?
   (A) 392 Articles and 7 Schedules
   (B) 395 Articles and 8 Schedules
   (C) 395 Articles and 6 Schedules
   (D) 396 Articles and 4 Schedules

2. The Panchayat System was introduced after this Amendment of the Constitution:
   (A) 65th Amendment
   (B) 68th Amendment
   (C) 72nd Amendment
   (D) 73rd Amendment

3. The original Constitution of India was handwritten by
   (A) Rafi Ahmed Kidwai.
   (B) Prem Behari Narain Raizada.
   (C) Kailash Nath Katju.
   (D) Kanaiyalal Maneklal Munshi.

4. What is the maximum life of an ordinance promulgated by President of India?
   (A) 7 months and 5 weeks
   (B) 8 months
   (C) 6 months and 6 weeks
   (D) 1 year

5. In which year did Goa become the 25th State of India?
   (A) 1987
   (B) 1988
   (C) 1989
   (D) 1990

6. Chief Ministers of all the States are ex-officio members of the
   (A) Planning Commission.
   (B) National Development Council.
   (C) Inter-state Council.
   (D) Finance Commission.

7. A Bill cannot become an Act of Parliament in India, unless and until
   (A) it is passed by the Lok Sabha.
   (B) it is passed by the Rajya Sabha.
   (C) it is passed by both the Lok Sabha and Rajya Sabha.
   (D) The President of India gives his assent to the Bill.

8. Which Constitutional Article lays down the provision for a National Commission for SC and ST?
   (A) Article 337
   (B) Article 334
   (C) Article 338
   (D) Article 339

9. 'Doctrine of Pleasure' was introduced in
   (A) Article 317.
   (B) Article 312.
   (C) Article 310.
   (D) Article 318.

10. Impeachment of the President of India can be initiated _____.
   (A) only in the Lok Sabha
   (B) only in the Rajya Sabha
   (C) in either House of Parliament
   (D) in the Supreme Court

11. How many Indian States have both the House of Parliament?

(A) 9
(B) 7
(C) 8
(D) 6

12. What does the 8th Schedule of the Indian Constitution deal with?

(A) Administration of Tribal Areas
(B) Panchayat Raj
(C) Official Languages
(D) Municipalities

13. Which High Court was established on 1st January, 2019?

(A) Tripura High Court
(B) Telangana High Court
(C) Manipur High Court
(D) Jammu and Kashmir High Court

14. Who acts as the President of India when neither the President nor the Vice President is available?

(A) Senior most Governor of a State
(B) Chief Justice of India
(C) Speaker of Lok Sabha
(D) Auditor General of India

15. The Constitution declares India to be a sovereign, socialist, secular, democratic republic, assuring its citizens of justice, equality and liberty, and endeavours to promote fraternity among them. The words "socialist" and "secular" were added to the definition in year:

(A) 1956
(B) 1976
(C) 1970
(D) 1952

16. The Right to Property was dropped from the list of Fundamental Rights by the

(A) 24th Amendment.
(B) 42nd Amendment.
(C) 44th Amendment.
(D) None of the above

17. Which Article provides for procedure in Parliament with respect to Estimates ?

(A) Article 110
(B) Article 111
(C) Article 113
(D) Article 114

18. Which of the following amendment bills exempted the State of Bihar from the obligation of having a Tribal Welfare Minister?

(A) 92nd
(B) 93rd
(C) 94th
(D) 95th

19. Who was elected as the Permanent President of the Constituent Assembly?

(A) Dr. Rajendra Prasad
(B) B. R. Ambedkar
(C) Sardar Vallabhbhai Patel
(D) Frank Anthony

20. How many Fundamental Duties are provided by the Constitution of India?

(A) Twelve
(B) Eleven
(C) Thirteen
(D) Nine

21. A member of a State Public Service Commission can be removed on the ground of misbehaviour only after the enquiry has been held by

(A) Joint Parliamentary Committee.

(B) Committee constituted by the Governor of the concerned State.

(C) High Court of the concerned State.

(D) Supreme Court of India.

22. Under the Panchayati Raj system Gram Sabha consists of

(A) elected executives of a village.

(B) persons who are registered in the electoral rolls relating to a village.

(C) elected executives of a village and officials nominated by him/her.

(D) the village Surpanch and the persons nominated by him/her.

23. From which country was the idea of 'Concurrent List' in the Indian Constitution borrowed?

(A) Japan

(B) United States

(C) Australia

(D) China

24. Choose the correct statement stated in the Constitution of India:

(A) India, that is Bharat, shall be a Federation of States.

(B) India, that is Bharat, shall be a Union of States.

(C) India, that is Bharat, shall be a Quasi Federal State.

(D) India, that is Bharat, shall be a Unitary State.

25. Which of the following writs means 'to be informed'?

(A) Quo-Warranto

(B) Prohibition

(C) Mandamus

(D) Certiorari

26. Which one of the following High Courts has the Territorial Jurisdiction over Andaman and Nicobar Islands?

(A) Calcutta High Court

(B) Orissa High Court

(C) Andhra Pradesh High Court

(D) Madras High Court

27. Article 78 of the Constitution deals with

(A) President's power to get information from the Council of Ministers.

(B) Prime Minister's duty regarding keeping the President informed about the government's decisions and policies.

(C) emergency powers of the President.

(D) President's power to send advisory messages to the Parliament.

28. Which committee recommended for the establishment of a State Finance Commission for the allocation of finances to the Panchayats?

(A) Hanumantha Rao Committee

(B) Dantwala Committee

(C) L. M. Singhvi Committee

(D) Gadgil Committee

29. Sanskrit is the 2nd official language of which State in India?

(A) Karnataka

(B) Madhya Pradesh

(C) Uttarakhand

(D) Himachal Pradesh

30. Which committee recommended that there should also be reservation of seats for women in Panchayati Raj Institutions?

(A) Thungon Committee

(B) L. M. Singhvi Committee

(C) G.V.K. Rao Committee

(D) Gadgil Committee

31. Which Article of Indian Constitution contains special provisions with regard to the State of Maharashtra?

(A) 371
(B) 371 A
(C) 371 B
(D) 371 D

32. Which of the following amendments to the Constitution of India is also referred to as the 'mini Constitution'?

(A) 38th Amendment
(B) 42nd Amendment
(C) 35th Amendment
(D) 40th Amendment

33. Who among the following gave the following statement about the Indian Constitution?

'Indian Constitution strikes a good balance between extreme rigidity and too much flexibility.'

(A) B.R. Ambedkar
(B) M.V. Pylee
(C) Alexanderowic
(D) K.C. Wheare

34. Which of the following statements is not correct?

(A) The President is the head of military forces in India.
(B) The President can appoint a Commission to investigate into the conditions of SCs and STs.
(C) The President can declare any area as a Scheduled Area.
(D) The President of India chooses the Speaker of the Lok Sabha.

35. The Constitutional provision relevant for solving questions of repugnancy between a Central Law and a State Law is found in

(A) Article 156.
(B) Article 254.
(C) Article 300.
(D) Entry 42, List III.

36. Which Schedule of the Constitution of India prescribes the Forms of Oaths or Affirmations?

(A) 11th Schedule
(B) 4th Schedule
(C) 3rd Schedule
(D) 5th Schedule

37. Who becomes empowered to make laws when the President's rule is imposed in a State?

(A) The Governor
(B) The President
(C) The Prime Minister
(D) The Parliament

38. The members of the Election Commission in the Centre are appointed by

(A) Vice-President of India.
(B) Prime Minister of India.
(C) Chief Justice of India.
(D) President of India.

39. The 100th amendment in Indian Constitution provides

(A) protection of livelihood and regulation of street vending.
(B) acquiring of territories by India and transfer of certain territories to Bangladesh.
(C) emoluments, allowances and privileges to Governors.
(D) reorganisation of the State of Andhra Pradesh.

40. Which among the following languages was included in the eighth schedule by Constitution (21st) amendment Bill on 10 April 1967?

(A) Assamese
(B) Sindhi
(C) Gujarathi
(D) Konkani

41. The President nominates 12 Members of the Rajya Sabha according to

(A) their performance as office bearers of cultural societies.

(B) the recommendations made by the Vice-President.

(C) their role played in political set up of the country.

(D) their distinction in the field of science, art, literature and social service.

42. Which Article of the Constitution of India envisages that there shall be an Attorney-General of India?

(A) Article 78

(B) Article 76

(C) Article 67

(D) Article 113

43. Who can extend the jurisdiction of a High Court?

(A) The Parliament of India

(B) The President of India

(C) The Supreme Court of India

(D) The Governor of the State

44. Which Constitutional Amendment shifted subject like education from state list to concurrent list?

(A) 40th

(B) 41st

(C) 42nd

(D) 46th

45. In India the concept of single citizenship is adopted from

(A) The French Constitution.

(B) The Swiss Constitution.

(C) The Constitution of United States of America.

(D) The British Constitution.

46. Which Article of the Constitution empowers the President to appoint a Commission to investigate the condition of backward classes in general and suggest ameliorative measures?

(A) Article 342

(B) Article 344

(C) Article 340

(D) Article 339

47. As per Constitution of India, the Legislative Assembly of a State consists of not more than 500 and not less than 60 Members, but which one of the following states has 32 Members?

(A) Delhi

(B) Sikkim

(C) Goa

(D) Puducherry

48. For the Members of Parliament in India, who determines the salaries and allowances from time to time?

(A) Union Cabinet

(B) Ministry of Parliament Affairs

(C) Cabinet Secretariat

(D) Parliament by Law

49. How many times can the President of India seek re-election to his post ?

(A) Once

(B) 3 times

(C) 2 times

(D) Any number of times

50. The 10th Schedule of the Indian Constitution talks about

(A) Municipalities

(B) Forms of Oaths

(C) Validation of Regulations

(D) Anti Defection Act

51. Union Territory is administered by
(A) The Governor of the territory.
(B) The President of India directly.
(C) The President of India through an administrator appointed by him called the Lieutenant Governor.
(D) The Chief Minister of the territory and his Council of Ministers.

52. National Capital Territory of Delhi was constituted by
(A) Ordinance promulgated by the Lieutenant Governor.
(B) Ordinance promulgated by the President.
(C) 71st Amendment.
(D) 69th Amendment.

53. Article 227 of the Indian Constitution deals with
(A) High Court's power of superintendence.
(B) judicial review.
(C) powers of the Speaker.
(D) election of the Vice-President.

54. At which of its session, did the Congress officially accept the 'Socialistic Pattern of Society'?
(A) Bombay Session of 1953
(B) Avadi Session of 1955
(C) Calcutta Session of 1957
(D) Nagpur Session of 1959

55. In which case, Supreme Court held that any Constitutional amendment that takes away or abridges a Fundamental Right conferred by Part III is void?
(A) S R Bommai vs. Union of India, 1994
(B) Kesavananda Bharati vs. State of Kerala (1973)
(C) Golaknath vs. State of Punjab, 1967
(D) Minerva

56. In case a President dies while in office, the Vice-President can act as President for a maximum period of
(A) 1 year
(B) 3 months
(C) 6 months
(D) 2 years

57. From which country was the idea of concurrent list borrowed in India?
(A) Japan
(B) United States of America
(C) Australia
(D) China

58. Which Article is for the Protection of interests of Minorities?
(A) Article 59
(B) Article 39
(C) Article 49
(D) Article 29

59. The States were reorganized in the year 1956 mainly on the basis of which criteria?
(A) External and internal security
(B) Administration facility
(C) Linguistic and cultural uniformity
(D) Geographic similarity and resource allocation

60. Which schedule contains 'Forms of Oath and Affirmations'?
(A) Eleventh Schedule
(B) Fourth Schedule
(C) Third Schedule
(D) Fifth Schedule

61. Which of the Articles deals with the grants in aid by the Union Government to the States?

(A) Article 270
(B) Article 280
(C) Article 275
(D) Article 265

62. Who among the following has the Constitutional authority to make rules and regulations fixing the number of members of the UPSC?

(A) Vice-President
(B) President
(C) Home Ministry
(D) Cabinet Secretary

63. The Union Public Service Commission submits its annual report on its work to

(A) The Chief Justice of India.
(B) The Parliament.
(C) The President.
(D) The Union Home Minister.

64. The Government of India revoked the special status, or limited autonomy granted under Article 370 of the Indian Constitution to Jammu and Kashmir—when?

(A) August, 2019
(B) September, 2019
(C) October, 2019
(D) November, 2019

65. Choose the case in which the Supreme Court by a majority ruled that Parliament could amend any part of the Constitution of India, but it could not alter or destroy 'The basic structure' of the Constitution.

(A) Minerva Mills Case, 1980
(B) Golaknath Case, 1967
(C) Keshavananda Bharati Case, 1973
(D) A. K. Gopalan Case, 1950

66. In India, political parties are given recognition by

(A) Election Commission.
(B) Speaker of Lok Sabha.
(C) President.
(D) Law Commission.

67. Who is the highest Law Officer of India under Article 76 of the Constitution of India?

(A) The Solicitor General of India
(B) The Secretary General of the Dept. of Law in Centre
(C) The Attorney General of India
(D) The Vice-President of India

68. In which year, Balwant Rai Mehta Committee was appointed to examine the working of the Community Development Programme?

(A) 1951
(B) 1954
(C) 1957
(D) 1960

69. Who was the First Chief Justice of the Supreme Court of India?

(A) M. Patanjali Sastri
(B) H. J. Kania
(C) Bijan Kumar Mukherjea
(D) Mehr Chand Mahajan

70. Which is the oldest High Court established in India in 1862?

(A) The Bombay High Court
(B) The Calcutta High Court
(C) The Madras High Court
(D) The Allahabad High Court

71. Who can extend the jurisdiction of a High Court?

(A) The Parliament of India
(B) The President of India
(C) The Supreme Court of India
(D) The Governor of the State

72. Which Article of the Indian Constitution guarantees protection in respect of conviction for offences?

(A) Article 19
(B) Article 20
(C) Article 25
(D) Article 32

73. Who administers the oath of office to the President of India before he enters upon the office?

(A) Chief Justice
(B) Speaker
(C) Vice-President
(D) Prime Minister

74. How many schedules are there in the Indian Constitution?

(A) 22
(B) 17
(C) 97
(D) 12

75. Which Act granted Statehood to Arunachal Pradesh?

(A) Constitution Act, 1981
(B) Constitution Act, 1987
(C) Government of India Act, 1981
(D) Government of India Act, 1987

76. Which Amendment Act made Sikkim a full-fledged State of India?

(A) 34th Constitutional Amendment Act
(B) 35th Constitutional Amendment Act
(C) 36th Constitutional Amendment Act
(D) 37th Constitutional Amendment Act

77. Who administers the oath of office to the President of India before he enters upon the office?

(A) Chief Justice
(B) Speaker
(C) Vice-President
(D) Prime Minister

78. Which community gets special provision for Central Services in Article 336 ?

(A) Sikh Community
(B) Muslim Community
(C) Hindu Community
(D) Anglo-Indian Community

79. The Intellectual Property Appellate Board has been established under which Ministry?

(A) Ministry of Finance
(B) Ministry of Home Affairs
(C) Ministry of Commerce and Industry
(D) Ministry of External Affairs

80. Disputes between States in India comes to the Supreme Court under its

(A) Advisory jurisdiction.
(B) Appellate jurisdiction.
(C) Original jurisdiction.
(D) None of the above

81. 53rd Amendment of the Indian Constitution 1986 made full Statehood for

(A) Mizoram
(B) Tripura
(C) Manipur
(D) Meghalaya

82. The first woman Governor of a State in free India was

(A) Mrs. Indira Gandhi
(B) Mrs. Vijaya Laxmi Pandit
(C) Mrs. Sarojini Naidu
(D) Mrs. Sucheta Kripalani

83. Which Constitutional Article defines the Panchayat Raj ?

(A) 243O
(B) 243
(C) 243A
(D) 243I

84. The National Flag of Indian Union was adopted on _____.

(A) 15th August, 1947
(B) 26th November, 1949
(C) 22nd July, 1947
(D) 26th January, 1950

85. The Vice-President is the ex-officio Chairman of the

(A) Rajya Sabha.
(B) Lok Sabha.
(C) Planning Commission.
(D) National Development Council.

86. Which of the following committees suggested incorporating Fundamental Duties in the Indian Constitution?

(A) Swaran Singh Committee
(B) Narasimhan Committee
(C) Raghavan Committee
(D) Malhotra Committee

87. Which part of the Constitution of India describes citizenship at the commencement of the Constitution?

(A) Part I
(B) Part II
(C) Part III
(D) Part IV

88. Who was the Prime Minister of India when a Constitutional status for the Panchayati Raj and Urban Self-Governing Institutions was accorded?

(A) Indira Gandhi
(B) Rajeev Gandhi
(C) P.V. Narasimha Rao
(D) Atal Bihari Vajpayee

89. The Sixth Schedule of the Constitution of India does not provide Administration for

(A) Assam
(B) Meghalaya
(C) Tripura
(D) Manipur

90. Who of the following is the Chairman of the National Water Resources Council?

(A) Prime Minister of India
(B) Union Minister of Water Resources
(C) Union Minister of Agriculture
(D) Union Minister of Earth Sciences

91. Which of the following official documents is related with India?

(A) White Paper
(B) Green Paper
(C) Yellow Book
(D) Blue Book

92. In which case the Supreme Court specifically find that Preamble is not a part of the Constitution?

(A) Kesavananda Bharati Case
(B) The Berubari Union Case
(C) Both (A) and (B)
(D) None of the above

93. Which Article lays down that the laws declared by the Supreme Court would be binding on all Courts in India?

(A) Article 131
(B) Article 141
(C) Article 142
(D) Article 143

94. Which committee recommended Constitutional status to Panchayat?

(A) L. M. Singhvi Committee
(B) Santhanam Committee
(C) Ashok Mehta Committee
(D) Balwant Rai Mehta Committee

95. How many Articles were written on the Constitution when it came into effect?

(A) 410 Articles
(B) 415 Articles
(C) 365 Articles
(D) 395 Articles

96. The administrative and operational control of the Armed Forces is exercised by the

(A) Cabinet Committee on Political Affairs with Prime Minister as the Chairman
(B) Ministry of Defence
(C) Three Chiefs of the Army, Navy and Air Force Staff
(D) President

97. Under whose direct supervision is the Lok Sabha Secretariat?

(A) Cabinet Secretary
(B) Ministry of Parliament Affairs
(C) Speaker of Lok Sabha
(D) Prime Minister of India

98. The Preamble of the Indian Constitution was inspired by the Preamble of the Constitution of which country?

(A) U.S. Constitution
(B) Swiss Constitution
(C) British Constitution
(D) Constitution of Canada

99. Which Article is related to equality before law?

(A) Article 94
(B) Article 24
(C) Article 14
(D) Article 19

100. Which Right was not taken from the British Constitution in the Indian Constitution?

(A) Freedom of Press
(B) Right to Vote
(C) Fundamental Rights
(D) Educational Rights

101. Which of the following commodities is exported the most from India?

(A) Engineering goods
(B) Readymade garments
(C) Drugs and Pharmaceuticals
(D) Electronic goods

102. The Indian textile industry faces competition from

(A) China
(B) South Korea
(C) Japan
(D) All of the above

103. In which year did the agricultural sector register a negative rate of growth?

(A) 1990–1991
(B) 2002–2003
(C) 2003–2004
(D) 2004–2005

104. The Sarva Shiksha Abhiyan (SSA) aims at

(A) universalisation of elementary education.
(B) bridging of gender gaps in education.
(C) maintenance of a standard quality of education.
(D) All of the above

105. Rolling plan covered the period—

(A) 1973–78
(B) 1970–75
(C) 1980–85
(D) 1978–83

106. Which of the following is true about the immediate impact of globalisation initiated in 1991?

(A) Increase in informalisation of the economy
(B) Effective access to foreign markets
(C) Decrease in income inequalities
(D) None of the above

107. As the bankers' bank, the Reserve Bank requires every scheduled bank to maintain

(A) cash reserves with it.
(B) gold reserves with it.
(C) gold and foreign exchange reserves with it.
(D) gold and cash reserves with it.

108. Which of the following is known as the Diamond City of India?

(A) Hyderabad
(B) Surat
(C) Jaisalmer
(D) Dhanbad

109. The Finance Commissions of India

(A) evaluate the state of finances of the Union Government only.
(B) recommend the sharing of tax revenues by the Centre and the States.
(C) determine budgetary provisions.
(D) set guidelines for imposition of taxes.

110. REPO stands for in repo rate—

(A) Reverse Payment Option
(B) Repurchase Option
(C) Rupee Purchase Option
(D) Rupee Payment Option

111. Which of the following is not a direct tax in India?

(A) Income tax
(B) Wealth tax
(C) Entertainment tax
(D) Gift tax

112. Who was the last Deputy Chairman of the Planning Commission?

(A) Shri R.P. Sinha
(B) Shri Shyamal Ghosh
(C) Shri Vinay Kohli
(D) Shri Montek Singh Ahluwalia

113. Which of the following the Reserve Bank uses as an anti-inflationary measure?

(A) Decrease in the Bank Rate
(B) Increase in the Bank Rate
(C) Reduction in the Cash Reserve Ratio
(D) Open market purchases of Government securities

114. The Information Technology industry of India has a great potential

(A) to generate foreign exchange earnings.
(B) to generate employment for the masses.
(C) to ensure regional balance in industrial development.
(D) None of the above

115. When the Reserve Bank of India conducts open market sale of securities, the cash reserves of the commercial banks

(A) increase.
(B) decrease.
(C) remain constant.
(D) first increase and then fall.

116. In the very recent years which country accounts for the highest inward FDI for India?

(A) USA
(B) Mauritus
(C) Singapore
(D) Japan

117. Rupee has been devalued twice in

(A) 1965 and 1996
(B) 1966 and 1991
(C) 1968 and 1991
(D) 1966 and 1993

118. The main focus of selective credit controls used by the Reserve Bank of India to control credit is on

(A) credit for production and transportation of exportables.
(B) credit for production and transportation of consumables.
(C) credit for hoarding of goods in short supply and speculation in the market for such goods.
(D) credit for production and transportation of hardwares.

119. In which of the following industries Indian women are mostly employed?

(A) Textile and garment industry
(B) Jute industry
(C) Sugar industry
(D) Paper industry

120. In which year was the Reserve Bank of India nationalised?

(A) 1935
(B) 1956
(C) 1949
(D) 1961

121. The Eighth Plan was postponed by two years because of

(A) political changes at the centre.
(B) delay in approval.
(C) foreign exchange crisis.
(D) domestic disturbances at state levels.

122. Which of the following has registered a high rate of growth since the 1980s?

(A) Capital goods industries
(B) Consumer durable goods industries
(C) Intermediate goods industries
(D) Consumer non-durable goods industries

123. Which of the following is not a poverty alleviation programme?

(A) Integrated Rural Development Programme
(B) Ayushman Bharat Yojana
(C) Pradhan Mantri Gramin Awas Yojana
(D) National Rural Livelihood Mission

124. Fiscal deficit in the Central Budget of India is

(A) total expenditure minus revenue receipts.
(B) total expenditure minus capital receipts.
(C) revenue expenditure minus revenue receipts.
(D) total expenditure minus total receipts excluding borrowings and other liabilities.

125. India's foreign exchange reserves have continuously increased since 2000-01 because of

(A) speeding up of economic reforms.
(B) relatively higher interest rates in India compared to rates prevailing in the international capital market.
(C) a strong bullish turn in the Indian stock market attracting foreign institutional investors.
(D) All of the above

126. The Reserve Bank of India issues currency notes maintaining

(A) a minimum reserve of gold.
(B) a minimum reserve of rupee coins and foreign exchanges.
(C) a minimum reserve of gold and foreign exchanges.
(D) a minimum reserve of bills of exchange and promissory notes payable in India.

127. In 2023, which country has emerged as the biggest trading partner of India?

(A) Japan
(B) Bangladesh
(C) United States
(D) South Korea

128. The impact of first generation economic reforms on employment generation and poverty reduction has

(A) been satisfactory.
(B) been good.
(C) been spectacular.
(D) not been satisfactory.

129. Which of the following programmes helps to promote rural development in India?

(A) Bharat Nirman
(B) Pradhan Mantri Gramin Aawas Yojana
(C) MGNREGA
(D) All of the above

130. GST is imposed on

(A) production of goods and services.
(B) consumption of goods and services.
(C) exports of goods and services.
(D) imports of goods and services.

131. Which of the following is the main role of the Reserve Bank of India?

(A) To maintain financial stability

(B) To promote agricultural growth

(C) To promote banking habits among the people of the country

(D) To maintain regional balance in the development of the Indian economy

132. Which of the following programmes is meant exclusively for women?

(A) ICDS

(B) STEP

(C) MGNREGA

(D) NRHM

133. Which of the following is a poverty alleviation programme?

(A) MGNREGA Scheme

(B) Bharat Nirman

(C) SSA

(D) NRHM

134. Which of the following is not a function of the Reserve Bank of India?

(A) Changing the bank rate.

(B) Managing open market operations.

(C) Acting as the lender of the last resort to the commercial banks.

(D) Taking decision regarding the use of deficit financing to close the gap between revenues and expenditures of the Government.

135. Which of the following is not a part of land reforms in India?

(A) Fixation of ceilings on landholdings

(B) Imposition of tenancy reforms

(C) Consolidation of holdings

(D) Ceilings on the use of machines on farms

136. Indian Rupee is fully convertible in

(A) Current Account

(B) Capital Account

(C) Trade Account

(D) None of the above

137. Who is the Chairman of the 15th Finance Commission?

(A) C. R. Rangarajan

(B) N. K. Singh

(C) Y. V. Reddy

(D) Bimal Jalan

138. The First Five Year Plan was based on the

(A) Mahalanobis model

(B) Nehru model

(C) Harrod-Domar model

(D) Gandhi model

139. Which of the following gives institutional credit to promote sustainable agriculture and rural development?

(A) SBI

(B) RBI

(C) NABARD

(D) SEBI

140. India's Foreign Trade Policy is framed and implemented by

(A) Directorate General of Foreign Trade (DGFT)

(B) Home Ministry

(C) NITI Aayog

(D) Finance Commission

141. What is CRR?

(A) Current Repo Rate
(B) Cash Reserve Ratio
(C) Credit Rating Record
(D) Current Review Report

142. What was the reason behind the 1966-69 Plan Holiday?

(A) Two years of drought
(B) Lack of resources
(C) Increase in inflationary pressures
(D) All of the above

143. Which of the following fixes the Repo Rate and the Reverse Repo Rate in India?

(A) Ministry of Finance
(B) Reserve Bank of India
(C) Comptroller and Auditor General of India
(D) State Bank of India

144. Which of the following is a commercial bank?

(A) Reserve Bank of India
(B) State Bank of India
(C) State Co-operative Bank
(D) None of the above

145. What does GST stand for?

(A) Goods and Services Trade
(B) Goods and Services Tax
(C) Government Services Tax
(D) None of the above

146. Reserve Bank's monetary policy fails in controlling inflation when inflation is caused by

(A) deficit financing.
(B) shortages of goods.
(C) financing of business by non-bank financial companies.
(D) All of the above

147. The first Green Revolution in India covered

(A) wheat and rice
(B) pulses
(C) only wheat
(D) only rice

148. According to Reserve Bank directives, the concept of broad money M_2 is the aggregate of

(A) currency with the public and post office savings deposits.
(B) currency with the public and demand deposits of commercial banks.
(C) currency with the public, demand deposits of commercial banks and time deposits of commercial banks.
(D) currency with the public and time deposits of commercial banks.

149. Which of the following is not a recommendation of the Narasimham Committee (1998)?

(A) Greater autonomy for the public sector banks
(B) A segregation of the roles of the Reserve Bank as a regulator of banks and as a owner of bank
(C) Merger of large Indian banks
(D) Autonomy to the Development Financial Institutions

150. In which year was the Twelfth Plan completed?

(A) 2014
(B) 2015
(C) 2016
(D) 2017

151. India's population is larger than that of
(A) USA
(B) China
(C) Indonesia
(D) All of the above

152. Which sector contributes most to Gross Domestic Product in India?
(A) The Industrial Manufacturing sector
(B) The Agricultural sector
(C) The Tertiary sector
(D) The Mining sector

153. The legal provisions governing the management of foreign exchange reserves are laid down in the Reserve Bank of India Act—
(A) 1947
(B) 1934
(C) 1949
(D) 1999

154. What percentage of India's work force is engaged in the informal sector?
(A) 90 per cent
(B) 75 per cent
(C) 93 per cent
(D) 85 per cent

155. The bank rate is the interest rate that
(A) the Reserve Bank charges the non-bank financial intermediaries for lending them money.
(B) the commercial banks charge the business houses for giving them loans.
(C) the Reserve Bank charges the commercial banks for lending them money.
(D) the Foreign Exchange Banks charge the users of foreign exchange.

156. Which of the following is a major manufactured export item of India?
(A) Textile machinery
(B) Tea
(C) Gems and Jewellery
(D) Steel

157. The Child and Adolescent Labour (Prohibition and Regulation) Act, 2016
(A) prohibits the employment of children under 14 years in all occupations.
(B) prohibits the employment of adolescent labour under 18 years in all hazardous occupations.
(C) prohibits the use of child labour in domestic work.
(D) All of the above

158. The latest population census was undertaken in
(A) 2011
(B) 2021
(C) 2022
(D) 2010

159. The first organised Stock Exchange in India was started in
(A) Kolkata
(B) Bombay
(C) Ahmedabad
(D) Chennai

160. When has demonetisation been last announced?
(A) 2018
(B) 1978
(C) 1995
(D) 2016

161. Which of the following is not shared by the Central and the State Governments?

(A) Property tax
(B) Basic Customs duty
(C) Stamp duty
(D) All of the above

162. Which of the following goods India imports most?

(A) Petroleum Crude
(B) Gold
(C) Organic Chemicals
(D) Computer Hardwares

163. What has been brought in place of the Planning Commission?

(A) NABARD
(B) SEBI
(C) NITI Ayog
(D) National Institute of Planning

164. Which of the following issues currency notes above denomination of one rupee note?

(A) Union Finance Ministry
(B) Reserve Bank of India
(C) State Bank of India
(D) Union Commerce and Industry Ministry

165. In order to increase money supply, which of the following does the Reserve Bank pursue?

(A) Reduction in the Cash Reserve Ratio
(B) Increase in the Statutory Liquidity Ratio
(C) Increase in the Repo Rate
(D) Restriction of credit in selective sectors

166. For most goods and services, the Goods and Services Tax is shared by the Central and the State Governments in the ratio of

(A) 50 : 50
(B) 40 : 60
(C) 60 : 40
(D) 70 : 30

167. The largest Employer in India is the

(A) Manufacturing sector
(B) Agricultural sector
(C) Services sector
(D) Constructions

168. Inclusive growth is that process of growth

(A) where all people participate and benefit equitably.
(B) where financial inclusion dominates.
(C) where social inclusion dominates.
(D) where poorer people get all the benefits.

169. Which of the following is incorrect? The Reserve Bank of India

(A) influences the regulatory and supervisory standards of the non-banking financial companies.
(B) stabilises the short term rates of interest or the call rates.
(C) provides rediscounting and borrowing facilities to the co-operative banks.
(D) provides loan facilities to the corporate houses.

170. Which of the following was an argument in favour of globalisation in 1991?

(A) Promotion of Foreign Direct Investment
(B) Boosting Agricultural Growth
(C) Alleviation of Poverty
(D) Promotion of Indigenous Technology

171. When was GST imposed?
(A) 2016
(B) 2018
(C) 2017
(D) 2015

172. Which of the following is a developmental function of the Reserve Bank of India?
(A) Promoting banking habits.
(B) Setting up of specialised financing agencies.
(C) Extending banking facilities to rural and semi-urban areas.
(D) All of the above

173. Which of the following countries has agreed to trade in the Indian rupee?
(A) USA
(B) Pakistan
(C) Sri Lanka
(D) Canada

174. Which of the following was the basic objective of the Twelfth Five Year Plan?
(A) Faster growth
(B) Faster and more inclusive growth
(C) Faster sustainable growth
(D) Faster, more inclusive and sustainable growth

175. Which of the following recorded highest growth rate in the Tenth Plan?
(A) Agriculture
(B) Services
(C) Manufacturing industry
(D) Mining

176. Which of the following monetary policy of the Reserve Bank of India does not aim at?
(A) Maintaining stability in the foreign exchange rates
(B) Promoting financial stability
(C) Ensuring a controlled rate of credit expansion
(D) Ensuring revenue-expenditure balance in the budget of the Central Government

177. The Minimum Needs Programme was introduced during the
(A) Third Five Year Plan
(B) Eighth Five Year Plan
(C) Fifth Five Year Plan
(D) Ninth Five Year Plan

178. India is self-sufficient in all important food items excepting
(A) Sugar
(B) Milk
(C) Oilseeds
(D) Vegetables

179. Which of the following comes under the Union Budget?
(A) Railways
(B) Municipalities
(C) Panchayats
(D) Posts and Telegraphs

180. Which of the following is a reputed software company in India?
(A) Larsen and Taubro
(B) Mahindra and Mahindra
(C) Hindustan Unilever
(D) HCL Technologies

181. The First Generation Reforms in India was characterised by

(A) Privatisation
(B) Liberalisation
(C) Globalisation
(D) All of the above

182. Which of the following states has the highest infant mortality rate in India?

(A) Madhya Pradesh
(B) Uttar Pradesh
(C) Odisha
(D) West Bengal

183. Finance for the Indian plans was obtained from

(A) Domestic savings
(B) Public borrowing
(C) Deficit financing
(D) All of the above

184. Who advocated "Panchayati Raj" system for India?

(A) J. L. Nehru
(B) M. K. Gandhi
(C) V. K. R. V. Rao
(D) Sardar Vallabhbhai Patel

185. The first Act addressing the issue of Child Labour was passed in

(A) 1950
(B) 1938
(C) 1986
(D) 2016

186. The first Green Revolution was launched to ensure

(A) exportable surplus in food production.
(B) food security.
(C) sustainable environment.
(D) technological advancement in agriculture.

187. Which is not an indirect tax in India?

(A) Customs
(B) Excise
(C) Sales tax
(D) Corporate tax

188. Securities and Exchange Board of India was established on

(A) July 12, 1982
(B) April 12, 1988
(C) July 9, 1988
(D) April 5, 1995

189. The majority of child labour in India work in

(A) Agriculture
(B) Manufacturing industries
(C) Construction
(D) Hotels and restaurants

190. Which of the following provides micro credit especially to women of India?

(A) Grameen Bank
(B) Rashtriya Mahila Kosh
(C) NABARD
(D) National Mission for Empowerment of Women

191. The LPG model of development was introduced in India in the year

(A) 2001
(B) 1991
(C) 1990
(D) 1981

192. In the recent years which sector dominates in FDI inflows in India?

(A) Computer Software and Hardware
(B) Chemicals
(C) Tourism
(D) Agriculture

193. Which of the following is a recently framed labour code of the Government of India?

(A) Code on wages
(B) Industrial relations code
(C) Code on social security
(D) All of the above

194. As per the 2021 Census, which of the following has the lowest population density?

(A) Sikkim
(B) Arunachal Pradesh
(C) Himachal Pradesh
(D) Madhya Pradesh

195. Indian investments abroad are mainly in

(A) South-East Asia
(B) South Asia
(C) Europe
(D) USA

196. Why did India have two Sixth Five Year Plans?

(A) Indo-China conflict
(B) Poor monsoon
(C) Balance of payments crisis
(D) Change of power at the Center

197. MGNREGA mandates participation of women by at least

(A) 50 per cent
(B) 40 per cent
(C) 30 per cent
(D) 33 per cent

198. How do commercial banks create money?

(A) By printing money
(B) By lending a part of its deposits
(C) By issuing ATM cards
(D) By borrowing from the Reserve Bank

199. The Finance Commission is constituted by the President every

(A) 10 years
(B) 5 years
(C) 2 years
(D) 12 years

200. Who among the following Prime Ministers of India has also served as the Governor of the Reserve Bank?

(A) P.V. Narasimha Rao
(B) Manmohon Singh
(C) Indira Gandhi
(D) Jawaharlal Nehru

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO.

2023

TEST BOOKLET

PAPER - VI

TEST BOOKLET SERIES

D

Time allowed : 3 hours

Full marks : 200

Answer ***all*** the questions.

Questions are of equal value.

Serial No. 6005500 .....

Roll No.:

Signature of the Candidate:

INSTRUCTIONS

Candidates should read the following instructions carefully before answering the questions:

1. This booklet consists of 28 pages including this front page, containing 200 questions. **Verify the Page Nos. and Test Booklet series on each page and bring at once to the Invigilator's notice any discrepancy.**
2. Answers will have to be given in the OMR Sheet supplied for the purpose.
3. Before you proceed to mark in the OMR Sheet in response to various items in the Test Booklet, you have to fill in some particulars in the OMR Sheet. ***Do not fold the OMR Sheet as this will result in error in your marks.***
4. All questions are of multiple-choice answer-type. You will find ***four*** probable answers **(A)**, **(B)**, **(C)** and **(D)** against each question. Find out which of the four answers appears to you to be **correct or the best.** Now darken the circle corresponding to the letter of the selected answer in the Answer-Sheet with **Black Ball Point Pen** as per instructions printed in the reverse **of the Admit Card** and in the Answer-Sheet.
5. One and only one circle is to be fully blackened for answer. Any spot in any other circle (multiple circle) or in wrong circle will be considered as wrong answer. If more circle is encoded for a particular answer, it will be treated as a wrong answer.
6. ***There will be negative marking of 0·25 mark for each wrong answer.***
7. ***There are blank pages at the end of this Booklet for Rough Work.***
8. ***The Special Answer-Sheet should be handed over to the Invigilator before leaving the Examination Hall. You are permitted to take away the used Test Booklet after completion of the examination.***

1. If x, y, z are real and $(x-2)^2 + x^2 + y^2 + 2z^2 - 2yz - 2xz = 0$; then the value of $(x + y + z)$ is

(A) 2

(B) 8

(C) 6

(D) 10

2. The area of the circum circle of the equilateral triangle is 154 cm^2. The length of the longest side of the triangle

(A) $7\sqrt{3}$ cm

(B) 7 cm

(C) 3·5 cm

(D) 28 cm

Following question is based on letter series. In each series some letters are missing. The missing letters are given in the proper sequence as one of the alternatives. Find the correct alternative in each case and mark the right alternative on the OMR Answer Sheet.

3. *abca__bcaab__aab__aa__ca*

(A) *ccaa*

(B) *accb*

(C) *abac*

(D) *abba*

4. Three numbers are in the ratio $\frac{1}{2}:\frac{2}{3}:\frac{3}{4}$. The difference between the greatest and the smallest number is 36. The numbers are

(A) 72, 84, 108

(B) 60, 72, 96

(C) 72, 84, 96

(D) 72, 96, 108

5. What sum of money lent at 4% p.a. for 3 years will earn same interest as ₹ 1,200 earns in 4 years at 5% p.a. of simple interest?

(A) ₹ 1,000

(B) ₹ 1,500

(C) ₹ 2,000

(D) ₹ 2,500

6. Money : Misappropriation : : Writing : ?

(A) Deception

(B) Mistake

(C) Plagiarism

(D) Theft

7. A pipe can fill a tank with water in 3 hours. Due to leakage in bottom, it takes $3\frac{1}{2}$ hours to fill it. In what time the leak will empty the fully filled tank?

(A) 12 hours

(B) 21 hours

(C) $6\frac{1}{2}$ hours

(D) $10\frac{1}{2}$ hours

8. The average of 11 results is 32. The average of first five result is 27 and that of the last five result is 34. The sixth result is:

(A) 48

(B) 50

(C) 47

(D) 52

9. In an examination, 60% of the candidates passed in English, 70% in Maths and 40% in both subjects. How many students failed in both subjects?

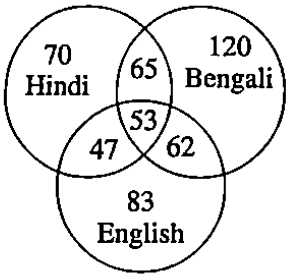
(A) 10%

(B) 20%

(C) 30%

(D) 40%

Direction: The diagram shows the survey on a sample of 500 persons with respect to their knowledge of Bengali, Hindi and English.



10. How many persons who do not know Hindi Language?

(A) 265
(B) 200
(C) 255
(D) 201

11. The shape of the lower portion of a solid is hemisphere and the shape of upper portion of it is right circular cone. If the surface areas of two parts are equal, find the ratio of the radius and height of the cone

(A) $1:\sqrt{3}$
(B) $\sqrt{3}:1$
(C) $2:\sqrt{3}$
(D) $\sqrt{3}:2$

12. The average marks obtained by 9 students was calculated to be 65. Later on it was found that the marks of one student was wrongly read as 76 instead of 67. The correct average is:

(A) 56
(B) 64
(C) 66
(D) 74

13. The ratio of measurement of an interior angle and an exterior angle of a polygon is 3:2. The number of sides of a polygon is

(A) 5
(B) 10
(C) 15
(D) 20

14. Train A took 35 minutes to cover a distance of 50 km. If the speed of train B is 25% faster than train A, it will cover the same distance in:

(A) 25 minutes
(B) 28 minutes
(C) 30 minutes
(D) 36 minutes

Direction: In the question same codes have been used to write words. Try to find out the rule of coding in each case and answer as per direction in the OMR Answer Sheet.

15. In a coding system. TIE = 34, NOW = 52, then what will be code for WAX = ?

(A) 47
(B) 46
(C) 48
(D) 45

16. A man lent ₹ 2,000 partly at 5% and the balance at 4%. If he receives ₹ 92 towards annual interest, find the amount lent at 5%.

(A) ₹ 800
(B) ₹ 900
(C) ₹ 1,000
(D) ₹ 1,200

17. If 35 is removed from data 30, 34, 35, 36, 37, 38, 39, 40 then the median increases by:

(A) 2
(B) 1·5
(C) 1
(D) 0·5

18. If A exceeds B by 40%, B is less than C by 20%, then A : C is:

(A) 28 : 25
(B) 26 : 25
(C) 3 : 2
(D) 3 : 1

19. The average of marks of 28 students in Mathematics was 50. Eight students left the school and then this average is increased by 5. What is the average of marks obtained by the students who left the school?

(A) 37·5
(B) 42·5
(C) 45
(D) 50·5

20. On a river, B is equidistance from both ends A and C. If a boat can go from A to B and back in 6 hours and from A to C in 8 hours, how long would it take to go from C to A?

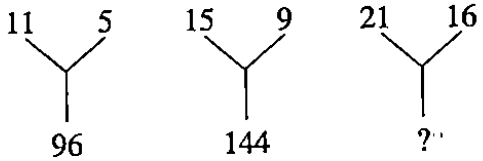
(A) 2 hours
(B) 4 hours
(C) 5 hours
(D) 6 hours

21. The diagonal of a square is $4\sqrt{2}$ cm. The diagonal of another square whose area is double that of the first square, is

(A) 8cm
(B) $8\sqrt{2}$ cm
(C) 16cm
(D) $4\sqrt{2}$ cm

Direction: In question, numbers are placed in figures on the basis of some rules. One place in the figure is indicated by the interrogation sign (?). Find out the correct alternative to replace the question mark and indicate your answer by filling the circle of the corresponding letter of alternatives in the OMR Answer Sheet.

22.



(A) 185
(B) 165
(C) 175
(D) 195

23. The ratio between two numbers is 5:3. If 3 is added to both the numbers, the ratio becomes 14 : 9. Find the smaller number.

(A) 15
(B) 18
(C) 25
(D) 28

24. If selling an article for ₹ 990 causes 10% loss on the selling price, find its cost price.

(A) ₹ 891
(B) ₹ 900
(C) ₹ 1,100
(D) ₹ 1,089

25. If $x+\frac{1}{x}=-1$, $x^3-1=?$

(A) 0
(B) 1
(C) –1
(D) 2

26. The present population of a city is 180000. If it increases at the rate of 10% per annum, its population after 2 years will be:

(A) 207800
(B) 227800
(C) 217800
(D) 237800

27. If the measures of two angles of a triangle are 65°20′3″ and 54°39′57″, then the circular value of third angle is:

(A) π^c
(B) $\frac{\pi^c}{2}$
(C) $\frac{\pi^c}{3}$
(D) $\frac{2\pi^c}{3}$

28. Two boats A and B start towards each other from two places, 108 km apart. Speeds of the boats A and B in still water are 12 km/hr and 15 km/hr respectively. If A proceeds down and B up the stream, they will meet after:

(A) 4·5 hours
(B) 4 hours
(C) 5·4 hours
(D) 6 hours

29. Ramesh and Rahman can do a work in 20 and 25 days respectively. After doing collectively 10 days of work, they leave the work due to illness and Suresh completes the rest of the work in 3 days. How many days Suresh alone can take to complete the whole work?

(A) 30 days
(B) 32 days
(C) 28 days
(D) 29 days

30. Successive discounts of 50% and 50% is equivalent to

(A) 100%
(B) 75%
(C) 50%
(D) 25%

31. Due to an increase of 50% in the price of eggs, 4 eggs are available for ₹ 24. The present rate of eggs per dozen is:

(A) ₹ 24
(B) ₹ 27
(C) ₹ 36
(D) ₹ 42

32. A certain sum of money amounts to ₹ 600 in 2 years and ₹ 700 in 4 years at a certain rate of simple interest. Find the rate of interest.

(A) 5%
(B) 8·16%
(C) 10%
(D) 16·33%

33. The length of each of two parallel chords AB and CD is 12 cm. If the length of the radius of the circle is 10 cm, then the distance between two chords is:

(A) 12 cm
(B) 14 cm
(C) 16 cm
(D) 18 cm

34. $\frac{1}{a+b+x}=\frac{1}{a}+\frac{1}{b}+\frac{1}{x}, x \neq 0, x = ?$

(A) a
(B) b
(C) $-a, -b$
(D) a, b

35. A shopkeeper sold an article at 20% loss. Had he sold it at ₹ 200 more, he could have earned a profit of 5%. What is cost price of the article?

(A) 800
(B) 8,000
(C) 700
(D) 600

36. In how many years will a sum of money double itself at $6\frac{1}{4}\%$ simple interest per annum?

(A) 16 years
(B) 15 years
(C) 10 years
(D) 20 years

37. The monthly incomes of two persons are in the ratio 2 : 3 and their monthly expenses are in the ratio 5 : 9. If each of them saves ₹ 600 per month, then their monthly incomes are

(A) ₹ 1,500; ₹ 2,250
(B) ₹ 1,200; ₹ 1,800
(C) ₹ 1,600; ₹ 2,400
(D) ₹ 1,400; ₹ 2,100

38. $\left(\frac{2+\sqrt{3}}{2-\sqrt{3}}+\frac{2-\sqrt{3}}{2+\sqrt{3}}+\frac{\sqrt{3}-1}{\sqrt{3}+1}\right)$ simplifies to

(A) $16-\sqrt{3}$

(B) $4-\sqrt{3}$

(C) $2-\sqrt{3}$

(D) $2+\sqrt{3}$

39. The salary of a man is decreased by 50% and then in the next year it is increased by 60%, then the resultant increment of his salary is:

(A) 10%

(B) 15%

(C) −20%

(D) −25%

40. A and B can do a work in 8 days, B and C can do the same work in 12 days. A, B and C together can finish it in 6 days. A and C together will do it in

(A) 4 days

(B) 6 days

(C) 12 days

(D) 8 days

41. 20% loss on selling price is what percent loss on the cost price?

(A) 25%

(B) 15%

(C) $16\frac{2}{3}\%$

(D) $16\frac{1}{3}\%$

42. The average weight of 30 students of a class is 45 kg. The average weight of girls is 37kg. and that of boys is 49 kg. Find the number of boys in the class.

(A) 10

(B) 15

(C) 20

(D) 22

43. If $\frac{9^n \times 3^5 \times (27)^3}{3 \times (81)^4} = 27$, then value of n is

(A) 0

(B) 2

(C) 3

(D) 4

Direction: Read the following information and answer the question given below:

There are six children playing football namely A, B, C, D, E, F. A and E are brothers; F is the sister of E; C is the only son of A's uncle; B and D are the daughters of the brother of C's father.

44. How D is related to A?

(A) Cousin

(B) Sister

(C) Niece

(D) Uncle

45. The angle of elevation of a ladder leaning against a wall is 60° and the foot of the ladder is 4·7m away from the wall. The length of the ladder is:

(A) 4·7m

(B) 9·4m

(C) 8·4m

(D) 9·7m

46. The external bisectors of $\angle ABC$ and $\angle ACB$ of ΔABC meet at O. $\angle BAC = 70°$, value of $\angle BOC$ = ?

(A) 45°

(B) 55°

(C) 65°

(D) 75°

47. Rate of income tax is increased from 4% to 5%. However, the total tax liability of a person remains the same as was in the last year. If his income for the last year was ₹ 1,00,000, find his present income.

(A) ₹ 1,25,000
(B) ₹ 90,000
(C) ₹ 80,000
(D) ₹ 75,000

48. The sum of present ages of a father and his son is 36 years. When the son reaches father's present age, the sum of their ages will be 80 years. What is the present age of the son?

(A) 4 years
(B) 7 years
(C) 9 years
(D) 12 years

49. If food prices go up by 10%, by how much should a man reduce his consumption so as not to increase his expenditure?

(A) $9\frac{1}{11}\%$
(B) 10%
(C) $11\frac{1}{9}\%$
(D) 11%

50. Rahim walks 15 km towards North. From there he walks 9 km towards South. Then he walks 8 km towards East. How far and in which direction is he now from his starting point?

(A) 7 km North-East
(B) 10 km North-East
(C) 10 km South-West
(D) 7 km South-East

51. A bag contains ₹ 112 in the form of 1-rupee, 50-paise and 10-paise coins in the ratio 3 : 8 : 10. What is the number of 50-paise coins?

(A) 112
(B) 108
(C) 96
(D) 84

52. If the sum of three number is 92, 1st and 2nd in the ratio 2 : 3 and 2nd and 3rd in the ratio 3 : 4. The 1st number is:

(A) 20
(B) 22
(C) 24
(D) 26

53. A man can row 18 kmph in still water. It takes him thrice as long to row up as to row down the river. Find the rate of stream.

(A) 6 kmph
(B) 9 kmph
(C) 10 kmph
(D) 12 kmph

54. The average of runs of a cricket player of 10 innings was 32. How many runs must he make in his next innings so as to increase his average of runs by 4?

(A) 76
(B) 70
(C) 4
(D) 2

55. A man had 100 kgs of sugar, part of which he sold at 7% profit and rest at 17% profit. He gained 10 % on the whole. How much did he sell at 7% profit:

(A) 65 kg
(B) 35 kg
(C) 30 kg
(D) 70 kg

56. The ratio of investments of two partners is 11 : 12 and the ratio of their profits is 2 : 3. If A invests the money for 8 months, find for how much time B invests his money?

(A) 11 months
(B) 8 months
(C) 4 months
(D) 3 months

57. The value of

$$\frac{1}{\sqrt{1}+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\frac{1}{\sqrt{3}+\sqrt{4}}\cdots+\frac{1}{\sqrt{80}+\sqrt{81}} \text{ is}$$

(A) 9
(B) 7
(C) 8
(D) $\sqrt{80}$

58. A, B and C together undertook a work for ₹ 550. A and B together done $\frac{7}{11}$ of the work. Find C's share.

(A) ₹ 50
(B) ₹ 150
(C) ₹ 200
(D) ₹ 350

59. 7th term of the A.P. 5, 12, 19, ... is

(A) 45
(B) 47
(C) 40
(D) 33

60. If the sum of ₹ 500 amounts to ₹ 575 in 3 years, how much will ₹ 600 to in 4 years at the same rate of simple interest?

(A) ₹ 120
(B) ₹ 620
(C) ₹ 650
(D) ₹ 720

Direction: Read the following information and answer the question given below:

There are six children playing football namely A, B, C, D, E, F. A and E are brothers; F is the sister of E; C is the only son of A's uncle; B and D are the daughters of the brother of C's father.

61. How C is related to F?

(A) Brother
(B) Uncle
(C) Son
(D) Cousin

62. On selling an article for a certain price, a man loses 30%. What is his loss/profit percent, if he sells the article for double the price?

(A) 60% loss
(B) 15% loss
(C) 40% profit
(D) 30% profit

63. A man gains 10% by selling an article for a certain price. What is profit/loss if the article is sold for half the price?

(A) 40% loss
(B) 5% loss
(C) 5% profit
(D) 55% profit

64. $\frac{2}{3}$ rd of a number is 26. Find out 25% of the number.

(A) 9·35
(B) 9·45
(C) 9·55
(D) 9·75

65. Two pipes A and B can fill a tank in 15 minutes and 20 minutes respectively. Both the pipes are opened together, but after 4 minutes pipe A is turned off. What is the total time required to fill the tank?

(A) 10 min
(B) 11 min 45 sec
(C) 12 min 30 sec
(D) 14 min 40 sec

66. Average weight of 25 persons is increased by 1kg when one man weighing 60 kg is replaced by a new person. Weight of new person is

(A) 50 kg
(B) 61 kg
(C) 86 kg
(D) 85 kg

67. What is the ratio between times taken by a train 240m long to cross an electric pole and a bridge of 80m length?

(A) 2 : 3
(B) 3 : 4
(C) 4 : 5
(D) 5 : 6

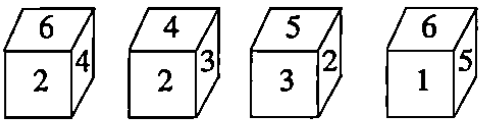
68. By selling 60 articles a vendor gains the selling price of 15 articles. His gain in percentage is:

(A) 25
(B) $33\frac{1}{3}$
(C) 20
(D) $28\frac{4}{7}$

69. A shopkeeper purchased a chair marked at ₹ 800, at two successive discounts of 10% and 15% respectively. He spent ₹ 28 on transporation and sold the chair for ₹ 800. His gain percent is:

(A) 40%
(B) 30%
(C) 25%
(D) 14%

70.



(i) (ii) (iii) (iv)

Which number is at the opposite face of number 2?

(A) 4
(B) 1
(C) 5
(D) 3

71. If the compound rate of interest for the 1st, 2nd and 3rd year be 4%, 5% and 6% respectively, then find the amount a man will receive at the end of 3 years investing ₹ 25,000.

(A) ₹ 28,938
(B) ₹ 27,938
(C) ₹ 28,948
(D) ₹ 28,937

72. If the cost price of 120 mangoes is equal to the selling price of 110 mangoes, find the gain or loss percent.

(A) 9%
(B) 10%
(C) $11\frac{1}{9}\%$
(D) $9\frac{1}{11}\%$

73. The remainder, when $(x^3 + 3x^2 + 3x + 1)$ is divided by $(x - 1)$, is

(A) 1
(B) 0
(C) 2
(D) 8

74. A sum of ₹ 1,540 is divided among A, B and C in such a way that A receives $\frac{2}{9}$ as much as B and C together receive, and B receive $\frac{3}{11}$ of what A and C together receive. Find the share of C.

(A) ₹ 280
(B) ₹ 330
(C) ₹ 930
(D) ₹ 980

75. ₹ 2,820 is to be divided among A, B and C such that 3 times A's share is equal to 4 times B's share and 5 times C's share. Find A's share.

(A) ₹ 1,200
(B) ₹ 950
(C) ₹ 705
(D) ₹ 1,655

76. The mean proportional of 16 and 25 is

(A) 400
(B) 100
(C) 20
(D) 40

77. The difference between simple interest and compound interest on ₹ 1,200 for one year at 10% per annum reckoned half-yearly is

(A) ₹ 2·50
(B) ₹ 3
(C) ₹ 3·75
(D) ₹ 4

78. A shopkeeper earns a profit of 12% on selling a book at 10% discount on the printed price. The ratio of the cost price to the printed price of the book is

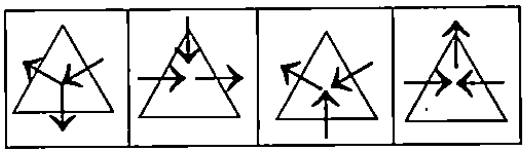
(A) 45:56
(B) 50:61
(C) 55:69
(D) 99:125

79. If the distance of the point (–12, *y*) from origin is 20 unit, then value of *y* is

(A) ± 15
(B) ± 16
(C) ± 14
(D) None of the above

Direction: In the question three out of four figures are alike in same respect and one is different from others. Find out the odd figure and indicate your answer by filling the circle of the letter denoting your selected answer on the OMR Answer Sheet.

80.



(A) (B) (C) (D)

81. The product of $(2-\sqrt{3})(2+\sqrt{5})(4+2\sqrt{3})(\sqrt{5}-2)=?$

(A) 1
(B) 2
(C) 3
(D) 4

Direction: In the question there are two words separated by ':' and the other two separated from the first two by the symbol '::'. Find the relation between two sets of words and select one word from the right side of ':' which have the same relation as left side of the word of '::', find the circle of the letter denoting your selected answer on the OMR Answer Sheet.

82. Ocean : Water : : Glacier : ?

(A) Mountain
(B) Cave
(C) Ice
(D) Refrigerator

83. A, B and C enter into a partnership in the ratio $\frac{7}{2}:\frac{4}{3}:\frac{6}{5}$. After 4 months, A increases his share by 50%. If the total profit at the end of one year be ₹ 21,600, then B's share in the profit is

(A) ₹ 21,000
(B) ₹ 2,400
(C) ₹ 3,600
(D) ₹ 4,000

84. The average marks obtained by a group of 10 students is 41 marks. Find the new average if a new student who scored 63 marks is also included in the group.

(A) 39
(B) 40
(C) 43
(D) 45

85. If the radius of a circle is diminished by 10%, then its area is diminished by

(A) 10%
(B) 19%
(C) 20%
(D) 36%

86. If A's income is 40% less than that of B, how much percent is B's income more than that of A?

(A) 60%
(B) 40%
(C) $66\frac{2}{3}\%$
(D) $33\frac{1}{3}\%$

87. If a sum becomes $\frac{2495}{2000}$ of itself in $4\frac{1}{2}$ years, find the rate of interest p.a.?

(A) 4%
(B) 5%
(C) 5·5%
(D) 6%

88. If $4 \times 5^x = 500$, then the value of x^x is–

(A) 8
(B) 1
(C) 64
(D) 27

89. A student gets 29% marks of an examination but fails by 24 marks. If the pass percentage is 35%, the maximum marks are

(A) 200
(B) 300
(C) 400
(D) 500

90. A sum of ₹ 5,000 amounts to ₹ 6,050 after 2 years at compound interest, interest compounded annually. What is the rate of interest per annum?

(A) 5%
(B) 9%
(C) 10%
(D) 11%

91. The roots of the quadratic equation $5x^2 + 13x + k = 0$ are reciprocal to each other, then value of k will be

(A) 5
(B) 0
(C) 4
(D) 6

92. A cloth store is offering 'Buy 3, get 1 free'. What is the net percentage discount being offered by the store?

(A) 20%
(B) 25%
(C) 30%
(D) $33\frac{1}{3}\%$

93. The ratio of the number of boys and girls is 3:2. If 20% of the boys and 30% of the girls are scholarship holders, then the percentage of students who do not get scholarship is

(A) 50
(B) 72
(C) 75
(D) 76

94. ₹ 4,250 is divided among 4 men, 5 women and 6 boys such that the share of a man, a woman and a boy are in the ratio 9 : 8 : 4. What is the share of a woman?

(A) ₹ 170
(B) ₹ 340
(C) ₹ 425
(D) ₹ 1,700

95. A man borrowed ₹ 2,500 at 4% p.a. and ₹ 1,800 at 5% p.a. simple interest for the same period. If he pays ₹ 570 as total interest, find the time for which the sums were borrowed.

(A) 2 years
(B) 3 years
(C) 4 years
(D) 5 years

96. A 270 meters long train running at the speed of 120 kmph crosses another train running in opposite direction at the speed of 80 kmph in 9 seconds. What is the length of the other train?

(A) 230 m
(B) 240 m
(C) 260 m
(D) 320 m

97. The H.C.F. of two natural numbers a and b is h and their L.C.M. is L, then value of $a^2 + b^2$ is (Given $h + L = a + b$)

(A) $h^3 + L^3$
(B) $h + L$
(C) $h^2 + L^2$
(D) $h^3 - L^3$

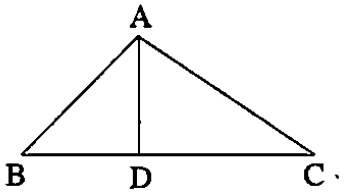
98. If $a = 2024$, $b = 2023$, $c = 2022$, then the value of $(a^2 + b^2 + c^2 - ab - bc - ca)$ is

(A) 0
(B) 3
(C) 4024
(D) 2012

99. $\sum_{i=1}^{10}(10 \times i) = ?$

(A) 650
(B) 450
(C) 550
(D) 750

100. In the adjoining figure, if $\angle ACB = \angle BAD$, AC = 8 cm, AB = 16 cm and AD = 3 cm, then BD = ?



(A) 3 cm
(B) 6 cm
(C) 2 cm
(D) None of the above

101. A and B can do a work in 12 and 15 days respectively. They started the work together but A left after 4 days due to illness. The remaining work was finished by B in:

(A) 5 days
(B) 6 days
(C) 10 days
(D) 12 days

102. When water is frozen to ice, its volume increases by 10%. What percent of the volume of ice decreases when it melts to water?

(A) $10\frac{1}{11}\%$
(B) $6\frac{1}{5}\%$
(C) $9\frac{1}{11}\%$
(D) 11%

103. Two trains, one from Howrah to Patna and other from Patna to Howrah, start simultaneouly. After they meet, the trains reach their destinations after 9 hours and 16 hours respectively. The ratio of their speeds is

(A) 2 : 3
(B) 4 : 3
(C) 6 : 7
(D) 9 : 16

104. A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely?

(A) 4 hours
(B) 4 hours 15 minutes
(C) 3 hours 15 minutes
(D) 3 hours 45 minutes

105. If the simple interest on a sum of money for 2 years at 5% per annum is ₹ 50, what is the compound interest on the same sum at the same rate and for the same time?

(A) ₹ 51·25
(B) ₹ 52
(C) ₹ 54·25
(D) ₹ 60

106. A grocer purchased 2kg of rice at the rate of ₹ 15 per kg. and 3kg. of rice at the rate of ₹ 13 per kg. At what price per kg. should he sell the mixture to earn $33\frac{1}{3}\%$ profit on the cost price?

(A) ₹ 28
(B) ₹ 20
(C) ₹ 18·40
(D) ₹ 17·40

107. A man bought an article for ₹ 21. What was the marked price of the article if he had bought the article at 30% discount?

(A) ₹ 30
(B) ₹ 32
(C) ₹ 33·50
(D) ₹ 35

108. Two vessels contain mixture of milk and water in the ratio 5 : 2 and 3 : 1 respectively. Find the ratio of milk and water in the new solution, if two mixtures are mixed in equal amount.

(A) 5 : 2
(B) 3 : 1
(C) 8 : 3
(D) 41 : 15

109. If a man goes to a place at an average speed of 10 km/hr and then returns at the average speed of 15 km/hr. Find his average speed during the whole journey.

(A) 12 km/hr
(B) 12·5 km/hr
(C) 13 km/hr
(D) 15 km/hr

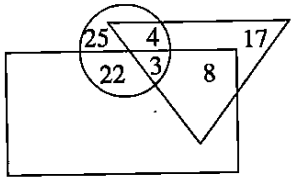
110. If $4^{x+2} = 2^{2x+3} + 2$, then value of x is

(A) –1
(B) 2
(C) –2
(D) 2

111. A dishonest merchant professes to sell his goods at cost price, but used a weight of 900 grams for one kg. What is his profit percent?

(A) 10%
(B) $11\frac{1}{9}\%$
(C) $9\frac{1}{11}\%$
(D) 11%

Study the figure carefully and answer the question. The triangle represents doctors, the circle represents players and the rectangle represents artists.



112. How many doctors are neither players nor artists?

(A) 17
(B) 30
(C) 8
(D) 19

113. If ₹ 126·50 is divided among A, B and C in the ratio of 2 : 5 : 4, the share of B exceeds that of A by

(A) ₹ 36·50
(B) ₹ 35·50
(C) ₹ 34·50
(D) ₹ 33·50

Direction: In the following question, a number series is given with one term missing. Choose the correct alternative that will continue the same pattern and answer on the OMR Answer Sheet by filling the circle.

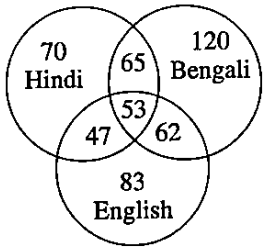
114. 2, 8, 18, 32, 50, ?

(A) 60
(B) 66
(C) 72
(D) 82

115. With an average speed of 40 km/hr, a train reaches the destination on time. If it runs with average speed 35 km/hr, it is late by 15 mins. The length of the total journey is:

(A) 30 km
(B) 180 km
(C) 40 km
(D) 140 km

Direction: The diagram shows the survey on a sample of 500 persons with respect to their knowledge of Bengali, Hindi and English.



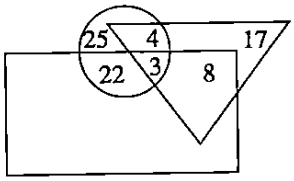
116. How many persons know all the three Languages?

(A) 65
(B) 62
(C) 53
(D) 47

117. A shopkeeper sold sarees at ₹ 266 each after giving 5% discount on labelled price. If he did not give the discount, he will be able to earn a profit of 12% on the cost price. What was the cost price of each saree?

(A) ₹ 280
(B) ₹ 250
(C) ₹ 240
(D) ₹ 260

Study the figure carefully and answer the question. The triangle represents doctors, the circle represents players and the rectangle represents artists.



118. How many artists are players?

(A) 30
(B) 29
(C) 25
(D) 17

119. A and B can do a work in 12 days, B and C in 15 days, C and A in 20 days. If A, B and C work together, they will complete the work in

(A) 5 days
(B) 10 days
(C) 12 days
(D) 18 days

120. The cost of 3 horses is same as the cost of 5 cows. If total cost of 4 horses and 6 cows is ₹ 1,900, find the cost of one horse.

(A) ₹ 50
(B) ₹ 150
(C) ₹ 200
(D) ₹ 250

121. If selling price of a commodity is increased by ₹ 35, the profit is increased by 7%. Find cost price of the article.

(A) ₹ 245
(B) ₹ 350
(C) ₹ 500
(D) ₹ 700

122. A cylindrical cistern of diameter 25 cm is full of water. If 11 litres of water is drawn off, the water level in the cistern will drop by $\left(\text{Use } \pi = \frac{22}{7}\right)$:

(A) $10\frac{1}{2}$cm
(B) $12\frac{6}{7}$cm
(C) $22\frac{2}{5}$cm
(D) $20\frac{2}{5}$cm

123. A cloth merchant sold half of his cloth at 20% profit, half of the remaining cloth at 20% loss and the rest was sold at its cost price. In the total transaction, his gain or loss will be

(A) 5% profit
(B) Neither loss nor gain
(C) 5% loss
(D) 10% profit

124. In 240 cc of a mixture of glycerine and water, the ratio of the volumes of water and glycerine is 1 : 3. How much cc of water should be added with the mixture so that ratio of the volumes of water and glycerine be 2 : 3?

(A) 60 cc
(B) 50 cc
(C) 80 cc
(D) 40 cc

125. A alone can do a piece of work in 21 days. B who is 40% more efficient than A, will finish the work in:

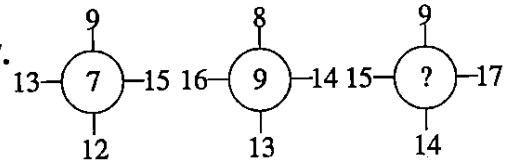
(A) 10 days
(B) 12 days
(C) 15 days
(D) 18 days

126. 4 men and 6 women can complete a work in 8 days, while 3 men and 7 women can complete it in 10 days. In how many days will 10 women complete it?

(A) 35
(B) 40
(C) 45
(D) 50

Direction: In question, numbers are placed in figures on the basis of some rules. One place in the figure is indicated by the interrogation sign (?). Find out the correct alternative to replace the question mark and indicate your answer by filling the circle of the corresponding letter of alternatives in the OMR Answer Sheet.

127.



(A) 8

(B) 7

(C) 9

(D) 6

128. A merchant mixes two varieties of wine containing 25% and 13% alcohol. The resultant mixture contains 17% alcohol. Find the quantity of second mixture, if 8 litre of first mixture is taken.

(A) 4 litres

(B) 16 litres

(C) 24 litres

(D) 32 litres

129. A retailer professes to sell his goods at cost price. If using a false weight, he still gains 25%, find the weight he uses in place of 1kg.

(A) 200 grams

(B) 600 grams

(C) 750 grams

(D) 800 grams

130. Divided ₹ 1,570 between A and B so that ₹ 25 being deducted from A's share and ₹ 45 from B's share, their share becomes 2:3. Find the amount received by A.

(A) ₹ 625

(B) ₹ 628

(C) ₹ 942

(D) ₹ 945

131. At what rate percent per annum will a sum of money double in 16 years?

(A) $6\frac{1}{4}\%$

(B) $6\frac{1}{2}\%$

(C) 6%

(D) $5\frac{1}{4}\%$

132. A and B started a partnership investing amounts in the ratio 2 : 3. After 6 months, C joined the partnership with an amount equal to that of B. The profit at the end of one year should be distributed among A, B and C in the ratio:

(A) 2 : 3 : 3

(B) 4 : 6 : 3

(C) 2 : 6 : 3

(D) 4 : 3 : 6

133. If a person walks at 14km/hr instead of 10km/hr, he would have walked 20km more. The actual distance travelled by him is

(A) 50km

(B) 56km

(C) 70km

(D) 80km

134. A group of 15 persons spends ₹ 4,500 in 6 months, find total expenditure of a group of 25 persons in 4 months, if expenditure per person is same in both the cases.

(A) ₹ 2,000

(B) ₹ 3,000

(C) ₹ 4,000

(D) ₹ 5,000

135. If the radius of a sphere is increased by 2cm, then its surface area increases by $352\,cm^2$. The radius of the sphere before the increase was

(A) 3cm

(B) 4cm

(C) 5cm

(D) 6cm

Please Turn Over

136. PST : 1 : : NPR : ?

(A) 3

(B) 4

(C) 1

(D) 7

137. Sum of present ages of A, B and C is 72 years. If 4 years ago, their ages were in the ratio 1 : 2 : 3, find A's present age.

(A) 7 years

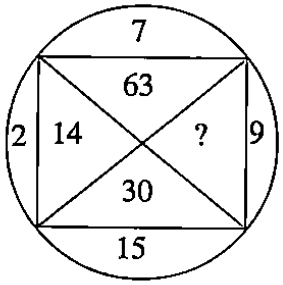
(B) 10 years

(C) 12 years

(D) 14 years

Direction: In question, numbers are placed in figures on the basis of some rules. One place in the figure is indicated by the interrogation sign (?). Find out the correct alternative to replace the question mark and indicate your answer by filling the circle of the corresponding letter of alternatives in the OMR Answer Sheet.

138.



(A) 18

(B) 33

(C) 135

(D) 145

139. Salary of a person is increased by 20%, then it is decreased by 20%. Change in his salary is:

(A) 4% decreased

(B) 4% increased

(C) 8% decreased

(D) remains same

140. A certain sum of money at a certain rate of simple interest becomes double in 5 years. It will become four times in:

(A) $7\frac{1}{2}$ years

(B) 10 years

(C) 15 years

(D) 20 years

141. A does half as much work as B in three-fourth of the time. If together they take 18 days to complete a work, how much time shall B take to do it alone?

(A) 30 days

(B) 35 days

(C) 40 days

(D) 45 days

142. If the length of two diagonals of a rhombus are 24 cm and 10 cm, the perimeter of rhombus is

(A) 13 cm

(B) 26 cm

(C) 52 cm

(D) 25 cm

143. A solution of salt and water contains 15% salt. If 4kg of water is evaporated, solution contains 18% salt. Find the original quantity of solution.

(A) 12 kg

(B) 18 kg

(C) 24 kg

(D) 36 kg

144. What sum of money will amount to ₹ 3,528 in 2 years at 5% per annum compound interest?

(A) 3,000

(B) 3,200

(C) 32,000

(D) None of the above

145. If the ratio of boys and girls in a city is 7:4, which of the following can not be the total number of boys and girls in the city?

(A) 29435417
(B) 57463822
(C) 28444625
(D) 29434526

146. ₹ 10,000 is borrowed at 20% p.a., interest compounded half-yearly. Find the amount repayable after one year.

(A) ₹ 11,000
(B) ₹ 12,000
(C) ₹ 12,100
(D) ₹ 14,400

147. A train travelling with uniform speed crosses two bridges of lengths 300m and 240m in 21 seconds and 18 seconds respectively. The speed of the train is

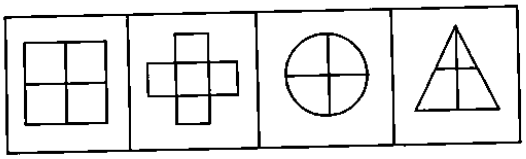
(A) 72 km/hr
(B) 68 km/hr
(C) 65 km/hr
(D) 60 km/hr

148. Two pipes A and B can fill a cistern in 60 minutes and 48 minutes respectively. Both pipes are opened together. The cistern will be filled in half an hour, if the pipe B is turned off after:

(A) 6 minutes
(B) 18 minutes
(C) 20 minutes
(D) 24 minutes

Direction: In the question three out of four figures are alike in same respect and one is different from others. Find out the odd figure and indicate your answer by filling the circle of the letter denoting your selected answer on the OMR Answer Sheet.

149.



(A) (B) (C) (D)

150. The roots of the equation $\frac{x^2}{x} = 6$

(A) 0
(B) 6
(C) 0, 6
(D) −6

151. Present ages of A and B are 50 years and 18 years respectively. In how many years will A be twice as old as B?

(A) 14 years
(B) 15 years
(C) 16 years
(D) 18 years

152. If the volume of two solid right circular cylinders are same and their height are in the ratio 1:3, then the ratio of lengths of radii is:

(A) $\sqrt{3}:1$
(B) $1:\sqrt{3}$
(C) 1:3
(D) 3:1

153. In an election 75% of the voters cast their votes; out of which 2% are rejected. If the successful candidates secures 9261 votes, which is 75% of the total votes, determine the total number of voters in that centre.

(A) 1680
(B) 168000
(C) 16800
(D) 26800

154. 5 men started a business contributing ₹ 20,000 each. Later on 6th men joined the partnership contributing ₹ 2,000 less than the average contribution of all the 6 men. Find the amount contributed by the 6th partner.

(A) ₹ 2,000
(B) ₹ 17,600
(C) ₹ 19,600
(D) ₹ 20,500

155. The external diameter of a conical-coronet made off thermocol is 21 cm in length. To wrap up the outer surface of the coronet with foil, the expenditure will be ₹ 57·75 at the rate of 10*p* per cm^2. The height of the coronet is

(A) 14 cm
(B) 28 cm
(C) 7 cm
(D) 10 cm

156. A boat running downstream covers 24km in 4 hours, while for covering the same distance upstream it takes 6 hours. What is the speed of the boat in still water?

(A) 3·5 km/hr
(B) 5·5 km/hr
(C) 6 km/hr
(D) 5 km/hr

157. The sum of two numbers is 2490. If 6·5% of one number is equal to 8·5% of the other, the greater number is

(A) 1079
(B) 1380
(C) 1411
(D) 1250

158. The marked price of an article is ₹ 1,050. A customer pays ₹ 798 for it with two successive discounts. If the rate of first discount is 20%, the rate of second discount is:

(A) 5%
(B) 6%
(C) 8%
(D) 10%

159. Some sweets were to be distributed equally among 175 students of a school. But due to absence of 35 students, each child got 4 more sweets. How many sweets were distributed?

(A) 2400
(B) 2800
(C) 2480
(D) 2680

160. A shopkeeper marks his goods 20% above cost price, but allows 30% discount for cash. His net loss is

(A) 8%
(B) 10%
(C) 16%
(D) 20%

161. The difference between the interest receive from two different bank on ₹ 500 for 2 years is ₹ 2·5. Find the difference between their rate of interest.

(A) 25%
(B) 20%
(C) 15%
(D) 10%

162. If a man allows 20% discount on all his articles, the number of the articles sold is increased by 20%. What will be the effect on total sale?

(A) 40% increase
(B) 4% increase
(C) 4% decrease
(D) No effect

163. Walking at $\frac{5}{4}$th of the usual speed, a person reaches his office 12 minutes too early. What is the usual time?

(A) 48 minutes
(B) 60 minutes
(C) 70 minutes
(D) 80 minutes

Here the four fundamental operations +, –, × and ÷ are represented by symbols from the usual one. You have to solve the problem by substituting the real symbol accordingly and indicate your answer by filling the circle of the letter denoting your selected answer on OMR Answer Sheet.

164. If L denotes ×, M denotes ÷, P denotes + and Q denotes –, then 7P24M8Q6M2L3

(A) 1
(B) 2
(C) 3
(D) 4

165. A certain amount of money has to be divided between two persons A and B in the ratio 3 : 5. But it was divided in the ratio 2 : 3 and thereby B loses ₹10. What was the amount?

(A) ₹ 250
(B) ₹ 300
(C) ₹ 350
(D) ₹ 400

166. Pipe A can fill a tank in 15 minutes and pipe B can drain 40 litres per minute. If both the pipes are opened together, the cistern is full in 45 minutes, find the capacity of the cistern.

(A) 600 litres
(B) 750 liters
(C) 900 liters
(D) 1800 liters

167. Bulu and Tathagata can do a work separately in 20 days and 30 days respectively. After working 7 days both of them left away. Then Anita came and completed rest of the work done alone in 10 days. How many days Anita will take to complete the work alone?

(A) 20 days
(B) 25 days
(C) 24 days
(D) None of the above

168. A man rows down a river 15 km is 3 hrs. with the stream and returns in $7\frac{1}{2}$ hrs. The rate at which he rows in still water is

(A) 2·5 km/hr
(B) 1·5 km/hr
(C) 3·5 km/hr
(D) 4·5 km/hr

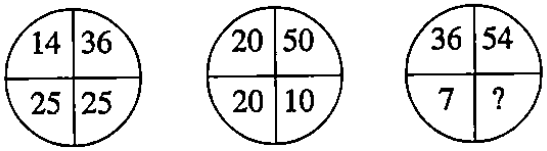
169. In how many years a sum of ₹ 2,500 at 18% simple interest per annum will earn same interest at ₹ 1,500 earns at 10% p.a. in 12 years?

(A) 3 years
(B) 4 years
(C) 5 years
(D) 6 years

170. A and B started a partnership in which A contributed $\frac{1}{4}$ of the capital for 9 months. If A received $\frac{1}{3}$ of the profit, for how long B's capital was invested?

(A) 6 months
(B) 8 months
(C) 10 months
(D) 12 months

171. Find the missing number:



(A) 1
(B) 0
(C) 2
(D) 3

172. On a certain some of money, the simple interest for 2 years is ₹ 350 at the rate of 4% per annum. If it was invested at compound interest at the same rate for the same duration as before, how much more interest would be earned?

(A) ₹ 3.50
(B) ₹ 7
(C) ₹ 14
(D) ₹ 35

173. The 5th and 11th term of an A.P. are 41 and 20 respectively. The first term is

(A) 45
(B) 65
(C) 35
(D) 55

174. In an examination 58% of the candidates passed in English and 68% passed in Mathematics but 17% failed both in Math and English. If 2150 candidates passed in both the subjects then how many candidates appeared in the examination?

(A) 5000
(B) 6000
(C) 5050
(D) None of the above

175. If $x-y \propto \frac{1}{z}$, $y-z \propto \frac{1}{x}$, $z-x \propto \frac{1}{y}$ then sum of three variation constant is:

(A) -1
(B) 0
(C) 1
(D) ± 1

176. The value of a machine depreciates @25% p.a. If its present value is ₹ 14,400, what will be its worth after 2 years.

(A) ₹ 8,100
(B) ₹ 9,216
(C) ₹ 10,200
(D) ₹ 10,800

177. If difference between simple interest on a certain sum at 4% for 6 years and at 5% for 4 years is ₹ 28, find the sum.

(A) ₹ 200
(B) ₹ 400
(C) ₹ 500
(D) ₹ 700

178. A cylindrical vessel of radius 4cm contains water. A solid sphere of radius 3cm is lowered into the water until it is completely immersed. The water level in the vessel will rise by

(A) $\frac{2}{9}$cm
(B) $\frac{4}{9}$cm
(C) $\frac{9}{4}$cm
(D) $\frac{9}{2}$cm

179. At the beginning of a year A and B jointly started a business by investing ₹ 17,000 and ₹ 20,000 respectively. After four months, A made a further investment of ₹ 4,000 in this business. If the profit was ₹ 9,520 at the end of the year, find the share of profit of A.

(A) ₹ 4,800
(B) ₹ 4,620
(C) ₹ 4,720
(D) ₹ 4,820

180. The wages of labourers in factory has increased in the ratio 22:25 and their number decreased in the ratio 3 : 2. What was the original wages bill of the factory if the present bill is ₹ 5,000?

(A) ₹ 4,000
(B) ₹ 6,000
(C) ₹ 8,000
(D) ₹ 6,600

181. In a hotel 60% had vegetarian lunch while 30% had non-vegetarian lunch and 15% had both types of lunch. If 96 people were present, how many did not eat either type of lunch?

(A) 20
(B) 24
(C) 26
(D) 28

Direction: In the following question, a number series is given with one term missing. Choose the correct alternative that will continue the same pattern and answer on the OMR Answer Sheet by filling the circle.

182. 2, 7, 27, 107, 427, ?

(A) 1262
(B) 1707
(C) 4027
(D) 4207

183. Price of an article increases by 20%. As a result turnover increases by 12%. Find the decrease in quantity sold.

(A) 5%
(B) 6·67%
(C) 6·66%
(D) 5·67%

Direction: In the question same codes have been used to write words. Try to find out the rule of coding in each case and answer as per direction in the OMR Answer Sheet.

184. In certain code 'PLAY' is written as 'TPEC'. How could 'GAME' be written in that code?

(A) KEQA
(B) KIQE
(C) KAQI
(D) KEQI

185. Keeping the radius of a right circular cone same, if the height of its increased thrice, the volume of it will be increased by:

(A) 100%
(B) 200%
(C) 300%
(D) 400%

186. A circular swimming pool is surrounded by a concrete wall 4 ft wide. If the area of the concrete wall surrounding the pool is $\frac{11}{25}$ that of the pool, then the radius of the pool is

(A) 8 ft
(B) 16 ft
(C) 20 ft
(D) 30 ft

187. In how many years will ₹ 2,000 amount to ₹ 2,420 at 10% per annum compound interest?

(A) 3
(B) $2\frac{1}{2}$
(C) $1\frac{1}{2}$
(D) 2

Direction: In the question there are two words separated by ':' and the other two separted from the first two by the symbol '::'. Find the relation between two sets of words and select one word from the right side of ':' which have the same relation as left side of the word of '::', find the circle of the letter denoting your selected answer on the OMR Answer Sheet.

188. AB : ZY : : CD : ?

(A) UV
(B) WX
(C) VU
(D) XW

189. If a person walks at 14 km/hr instead of 10 km/hr, he would have walked 20 km more. The actual distance travelled by him is:

(A) 50 km
(B) 56 km
(C) 70 km
(D) 80 km

190. A house worth ₹ 1,50,000 is sold by X at a 5% profit to Y, Y sells the house back to X at a 2% loss. Then find profit and loss in the entire transaction.

(A) X gains ₹ 4,350
(B) X loses ₹ 4,350
(C) X loses ₹ 3,150
(D) X gains ₹ 3,150

191. Sourima ranks 8th in a class of 35 students. What is his rank from the last?

(A) 26th
(B) 27th
(C) 29th
(D) 28th

192. Find the wrong number in the series:

1, 2, 8, 33, 148, 760, 4626

(A) 8
(B) 33
(C) 148
(D) 760

193. If it is Saturday on January 1, 2000, then January 1, 2001 will be

(A) Monday

(B) Tuesday

(C) Friday

(D) Saturday

194. P, Q and R can do a job in 20, 30 and 60 days respectively. The number of days P can do the job if he is assisted by Q and R every third day is

(A) 11 days

(B) 15 days

(C) 17 days

(D) 16 days

195. Two pipes, P and Q can fill a cistern in 12 and 15 minutes respectively. If both are opened together and at the end of 3 minutes, the first is closed, how much longer will the cistern take to fill?

(A) $8\frac{3}{4}$ minutes

(B) 5 minutes

(C) $8\frac{1}{2}$ minutes

(D) $8\frac{1}{4}$ minutes

196. Zinc and copper are in the ratio 5 : 3 in 200gm of an alloy. How much grams of copper be added to make the ratio as 3 : 5?

(A) 72

(B) $\frac{1}{200}$

(C) $133\frac{1}{3}$

(D) 66

197. A person lent two equal amounts of money at 12% p.a. for 3·5 years and 5·5 years respectively. If difference between two interests is ₹ 1,800, find total sum lent.

(A) ₹ 6,000

(B) ₹ 7,500

(C) ₹ 12,000

(D) ₹ 15,000

198. 24576, 6144, 1536, 386, 96, 24. Find the odd number of the above series.

(A) 96

(B) 386

(C) 1536

(D) 6144

199. Insert the missing number:

10, 5, 13, 10, 16, 20, 19, _____

(A) 22

(B) 40

(C) 38

(D) 23

200. The simplified value of $\left(2-\frac{1}{3}\right)\left(2-\frac{3}{5}\right)\left(2-\frac{5}{7}\right)\cdots\cdots\left(2-\frac{997}{999}\right)$ is

(A) $\frac{5}{999}$

(B) $\frac{1001}{999}$

(C) $\frac{1001}{3}$

(D) $\frac{501}{999}$

2023

POLITICAL SCIENCE

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and same language.*

Group-A

Answer *Question No.1* and *any two* from the rest.

1. Examine Rammohan Roy's view on freedom of thought, rule of law and social justice. How do you assess his role as the pioneer of Indian liberalism? 30+10

2. "The history of all hitherto existing society is the history of class struggle."— Discuss the Marxian theory of class struggle in the light of this statement. Explain, in this connection, how class struggle in Marxism has been viewed as the motive force of social change. 20+10

3. Explain the nature of the environmenal movements as social movement with special reference to India. What are the limitations of these movements? 20+10

4. Discuss the role of political Parties in the modern States. Are they indispensable in democracies? 20+10

Group-B

Answer *Question No.5* and *any two* from the rest.

5. Give an account of Directive Principles enshrined in Part-IV of the Indian Constitution. How do you justify the incorporation of unenforceable Directive Principles of State Policy? 20+20

6. "The President of India shall exercise his powers on the advice of his Council of Ministers."— Discuss in the light of this statement the constitutional position and role of the President. Is the President a 'glorified cipher'? 15+15

7. What is meant by regionalism? What are the various manifestations of regionalism in India today? What are its reasons? 5+15+10

8. Discuss the role of the Supreme Court of India as a custodian of the constitution and a protector of fundamental rights. Do you think "public interest litigation" has enlarged the Supreme Court's power to protect fundamental rights and promote social justice? 15+15

MWC(O)-PS-II/23

2023

POLITICAL SCIENCE

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer Question *No.1* and *any two* from the rest.

1. Answer *any five* from the following: 8×5=40
   (a) Democratic centralism as the organization principle of socialist management— Explain.
   (b) Unity of command as the principle of organisation— Explain.
   (c) Functions of Union Public Service Commission— Describe.
   (d) Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)— what it is?
   (e) Pradhan Mantri Kaushal Vikas Yojana— what it is?
   (f) Controversy over Lokpal as an institution for redressal of citizens' grievances— Discuss.
   (g) Dindayal Upadhyaya Gram Jyoti Yojana— what it is?

2. What is communication? Discuss briefly the role and importance of communication in an organisation. 10+20

3. Define centralisation. What are advantages of centralization? What are its limitations? 10+10+10

4. Write a note on the changing role of District Magistrate as the District Officer at the apex of district administration in West Bengal. 30

Group-B

Answer Question *No.5* and *any two* from the rest.

5. Answer *any five* from the following: 8×5=40
   (a) What is the P-20 summit? What role does it play as a part of G-20?
   (b) How does propaganda work as a technique of foreign policy?
   (c) What are the contributions of non-aligned movement?
   (d) What are the challenges has G7 faced?
   (e) What is cyber-terrorism?

(f) What are the main functions of WTO?

(g) Evaluate India's role in promoting regional cooperation through SAARC.

6. What do you understand by neo-colonialism? How is it different from colonialism? Examine the mechanism of neo-colonialism. 7+8+15

7. Write a critical note on peace keeping operations of United Nations. Is UNO obsolete and unnecessary?— Give reasons for your answer. 15+15

8. Discuss, in brief, the basic principles of Indian foreign policy. 30

2023

ANTHROPOLOGY

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and same language.*

Group-A

Answer *all* questions.

1. (a) Give an account of Lamarck's Theory of organic evolution and its contemporary explanations.
   (b) Discuss the evolutionary biology with reference to the vertebral column in the context of human evolution.
   (c) Briefly enumerate the neutral theory of evolution. 10+10+10

2. (a) Define genetic counseling and state different steps of genetic counseling.
   (b) Enumerate the use of pedigree and probabilities in genetics conseling.
   (c) State briefly the utility of amniocentesis and chorionic villi sampling in prenatal diagnosis. 10+10+10

3. (a) Enumerate the relationship of marriage, kinship and incest regulation.
   (b) Discuss the relationship of kinship, inbreeding and its possible effects on human genetics.
   (c) Assume a boy married the granddaughter of his father's sister and had a son. Draw the pedigree and calculate the inbreeding coefficient with justification. 10+10+10

Group-B

Answer *any three* questions.

4. (a) Give an account of health and disease in relation to communicable and non-communicable disease.
   (b) Discuss the association of socio-demographic with communicable (malaria) and non-communicable diseases (Type 2 diabetes) with suitable examples.
   (c) Enumerate briefly the effect of protein calorie under nutrition in children. 10+10+10

5. (a) Discuss Culture relativism in the context of acculturation, enculturation and diffusion with suitable examples.
   (b) Give an account of growth, development and maturation with suitable examples.
   (c) Give a brief account of race, ethnicity in the context of human variation with suitable examples. 10+10+10

6. (a) Give an account of anthropology of development and development anthropology in the context of anthropological engagements.
   (b) Enumerate briefly the anthropology of communication, with reference to visual anthropology mass media and popular culture.
   (c) Write a short review of ethnoarchaeology in India with special reference to mortuary practices and megalithic burials. 10+10+10

7. (a) Define and state features of Culture and Civilization.
   (b) Give an account of cultural relativism with suitable examples.
   (c) Define Anthropology of religion. Enumerate the approaches to the study of religion. 10+10+10

8. (a) Define Primates and provide the general classification of primates with suitable examples.
   (b) Give an account of the distributions and salient and distinguishing features of New World Monkey and Old World Monkey.
   (c) State the distribution of Apes and discuss the distinguishing features of Asian and African ape. 10+10+10

Group-C

9. Write Short notes on *any two* of the following: 10×2
   (a) Bergman's and Allen's rule.
   (b) Potassium Argon dating (K-Ar)
   (c) Hypothesis testing.
   (d) Human physique and somatotype.

2023

ANTHROPOLOGY

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any three* questions

1. (a) Give an account of economic, geographical and linguistic distribution of Indian Tribal Population.
   (b) Enumerate briefly the theory of the origin of caste system. State the salient features of caste system in India.
   (c) Give an account of folk culture and folk identity with suitable examples from West Bengal.
   (d) Discuss briefly about the Iron Age in India. 10+10+10+10

2. (a) Write a short review of ethnoarchaeology in India with special reference to mortuary practices and megalithic burials.
   (b) Discuss the Indus Valley Civilization in the context of its origin, distribution and decline.
   (c) Give an account of population variation in India in the context of hemoglobin polymorphism and Mitochondrial DNA (mtDNA).
   (d) Compare and contrast between the classification of Indian population of H.H. Risley and S. S. Sarkar. 10+10+10+10

3. (a) Discuss the importance of demography in Anthropology.
   (b) What are the major factors of dynamics of demography?
   (c) Write a short note on Sustainable Development Goal with reference to gender equality.
   (d) Assume the number of population in a country on January 1, 2005 was 100,000, population on December 31, 2005 was 150,000 and number of deaths was 5000. Calculate the crude death rate with justification. 10+10+11+9

4. (a) Write a note on impact of modern democratic institutions on traditional political system.
   (b) State the major problems of Indian tribes with special reference to issues of land and forest.
   (c) Write a note on constitutional safeguards for Scheduled Tribes.
   (d) Discuss briefly about medical anthropology and its relation with ethnomedicine. 10+10+10+10

5. Write short notes on *any two* of the following: 20×2
   (a) Bio Medical anthropology
   (b) Jajmani system
   (c) Classification of Indian polulation by B. S. Guha
   (d) Impact of Islam on Indian Society

Group-B

Answer *any two* of the following

6. (a) Give an account of minority issues in India with special reference to linguistic minority.
   (b) Write a note on sacred complex.
   (c) Briefly discuss on the issues of identity.
   (d) State a brief account on dominant caste with suitable examples. 10+10+10+10

7. (a) Give an account of Tribe-Peasant continuum.
   (b) Enumerate the contemporary classification of Indian population on the basis of Haptoglobin (HP) group.
   (c) Discuss about contemporary status of Narmada Man in Human Evolution in India.
   (d) Write in brief about the nature and distribution of Tribal movements in India. 10+10+10+10

8. (a) Discuss in brief about the factors affecting fertility with suitable examples.
   (b) Enumerate the effect of Sanskritization in Indian civilization with suitable examples.
   (c) Write a note on migration and the effects of migration.
   (d) Assume in a country of 1 crore population 20,000 are immigrant and 10,000 are emigrants; calculate the net migration with justified reasons. 10+10+10+10

2023

HISTORY

PAPER-I

Time Allowed—3 Hours *Full Marks—200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

1. Answer *any three* questions: 10×3=30

   (a) Give an account on the basic features of the Harappan Civilisation.

   (b) How did social conditions change from the early-Vedic to later-Vedic times?

   (c) Give an account of the cultural achievements of the Gupta era. Do you agree with the view that it was the Golden Age of Indian history?

   (d) The tripartite contest between the Palas, the Rashtrakutas and the Pratiharas was essentially a struggle for the North Indian heartland.—Comment.

2. Answer *any two* questions: 20×2=40

   (a) How do you account for the rise of heterodox religious movements in the fifth century B.C.?

   (b) What were the distinctive features of Mahayana Buddhism? How was it different from Hinayana Buddhism? 10+10

   (c) What are Agrahara and Brahmadeya land grants? What role did they play in the history of early medieval times?

3. Answer *any one* question: 30×1=30

   (a) Would you agree with the view that the Kushana Empire was Central Asian in its origin, but acquired many Indic features over the years?

   (b) How do you account for the proliferation of castes in early medieval India, during the 7th to 12th centuries?

Group-B

4. Answer *any three* questions: 10×3=30

   (a) Assess the role played by Balban in the Streng thening of central authority in the Delhi Sultanate.

   (b) Give an account of Muhammad-bin-Tughlaq's project for the transfer of capital. Would you say the Sultan was a visionary leader way ahead of his time?

   (c) Write an essay on the role played by Sufisum in the social life of medieval India.

   (d) What were the salient features of the Mughal school of painting?

5. Answer *any two* questions: 20×2=40

   (a) Give an account of the Market regulation policies of Alauddin Khilji. What impact did it have on the economy of the Sultanate? 15+5

   (b) The Vijaynagar - Bahmani rivalry was shaped less by religious differences, and more by struggle for geopolitical dominance.—Comment. 20

   (c) Write an essay on the economy of Mughal India. 20

6. Answer *any one* question: 30×1=30

   (a) The struggle between the Crown and the nobility was the defining feature of the Delhi Sultanate in the 13th and 14th centuries.—Discuss. 30

   (b) Trace the evolution of Mughal Deccan policy from Akbar to Aurangzeb. How did it contribute to the weakening of the Mughal Empire? 20+10

2023

HISTORY

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and same language.*

Group-A

Answer Question No. 1 and *any two* from the rest.

1. Answer *any one*:
   (a) What was the Subsidiary Alliance? How did it contribute in the rise of the East India Company to political dominance in the Subcontinent? 20
   (b) How did the British revenue settlements serve to change the nature of agrarian land-ownership in the Indian Countryside? 20
   (c) Write an essay on the nature of the uprising of 1857. 20
2. Analyse the circumstances in which nationalism emerged as a major factor in the political life of India in the second half of the nineteenth century. 40
3. Assess the contribution of Gandhi in India's freedom movement. 40
4. Write an essay on the integration of princely states into the Indian Union. 40

Group-B

Answer Question No. 5 and *any two* from the rest.

5. Answer *any one*:
   (a) Give an account of the administrative reforms of Napoleon. Is it fair to say that he only partially consolidated the gains from the French Revolution? 15+5
   (b) German unification was the result as much of coal and iron as it was of blood and iron. —Comment. 20
   (c) What were the factors that facilitated industrialisation in British economy in England during the eighteenth century. 20
6. Why did the Sarajevo killing in July 1914 result in the outbreak of the First World War? 40
7. Write an essay on the emergence of fascism as a political force in Europe during the inter-war era. 40
8. What caused the Cold War – ideological differences between the two superpowers, or conflict of interests between them? 40

2023

SANSKRIT

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be written either in **English** or in **Bengali** or in **Sanskrit**, but all answers must be in one and the same language, unless otherwise specified.*

Group-A

1. Assess an Introduction to Comparative Philology amidst diverse languages on Indo-European family.

30

Or,

Discuss briefly contribution of Sanskrit in Linguistic Studies showing difference between Vedic and Classical Sanskrit among the Indo-European family of languages. 30

2. Define and illustrate *any two* of the following types: 10×2=20
   (a) Collitz's law
   (b) Hiatus
   (c) Monophthong
   (d) Dialect

Group-B

3. Explain *any two* of the following rules in Sanskrit: 10×2=20
   (a) कर्तुरीप्सिततमं कर्म।
   (b) ध्रुवमपायेऽपादानम्।
   (c) शेषो बहुव्रीहिः।

4. Account for the case-ending in *any five* of the following underlined words by given citation of relevant Pāṇinian aphorisms on each case: 4×5=20
   (a) सिंहो माणवकः।
   (b) ग्रामं गच्छंस्तृणं स्पृशति।
   (c) वलिं याचते वसुधाम्।
   (d) एकादशीमुपवसन्ति निरम्बुभध्याः।
   (e) सर्पिषोऽपि स्यात्।
   (f) पशुना रुद्रं यजते।

5. Name and expound the Compound in *any five* of the following Samāsa pauses : 4×5=20

(a) दुर्यवनम्।

(b) परिविष्णु।

(c) खट्वरूढ़:।

(d) अश्वघास:।

(e) पुरुषोत्तम:।

(f) पञ्चगवम्।

(g) अग्नीवरुणौ।

6. Justify *any two* of the following sentences in Sanskrit: 10×2=20

(a) पुष्पाणि स्पृदयति।

(b) वदन्त्यपर्णेति च तां पुराविद:।

(c) इक्षुच्छायानिषादिन्य:।

(d) प्रत्यक्षाभि: प्रपन्नस्तनूमिरवतु वस्तामिरष्टाभिरीश:।

Group-C

7. Translate into English *any two* from the following Vedic Verses: 10×2=20

(a) य आत्मदा बलदा यस्य विश्व
उपासते प्रशिषं यस्य देवा:।
यस्य छायामृतं यस्य मृत्यु:
कस्मै देवाय हविषा विधेम।।

(b) अहं राष्ट्री संगमनी वसूनां
चिकितुषी प्रथमा यज्ञियानाम्।
तां मा देवा व्यदधु: पुरुत्रा
भूरिस्थात्रां भूर्या वेशयन्तीम्।।

(c) अद्या देवा उदिता सूर्यस्य
निरंहस: पिपृता निरवद्यात्।
तन्नो मित्रो वरुणो मामहन्ता –
मदिति: सिन्धु: पृथिवी उत द्यौ:।।

Group-D

8. Translate from English into Sanskrit: 30

A teacher imparts learning to the dull or foolish person as well as he does in the same way to the intelligent disciple. However, in the knowledge of the two neither he shows or does induce power nor perishes such a strength. So yet there does appear a vast difference as to the final result or goal. The aim is alike to a clear crystal that is able to reflect an image; a lump of clay can not be so far.

Or,

Translate after rendering into English from Sanskrit:

अथातो विमूतयोऽस्य पुरुषस्य। तस्य वाचा सृष्टौ पृथिवी चाग्निश्चास्यामोषधयो जायन्तेऽग्निरेना: स्वदयतीदमाहरतेदमाहरते-दमाहरतेत्येवमेतौ वाचं पितरं परिचरन्त: पृथिवी चाग्निश्च। यावदनु पृथिवी यावदन्वग्निस्तावानस्य लोको भवति नास्य तावल्लोको जीर्य्यते यावदेतयोर्न जीर्य्यते पृथिव्याश्चाग्नेश्च य एवमेतां वाचो विभूतिं वेद।।

Or,

Render into Sanskrit from English:

The Agni or Fire becomes Varuna in the Evening; at the Morning after rising he is similar to Mitra; he, having remains Savier, goes through the atmosphere, he also becomes Indra, burns through the midst of the sky after forming such types.

Group-E

9. Write a paragraph in *any one* of the following topics in Sanskrit: 20

(a) अतिमारीरोगस्य निराकरणे व्यवस्थापिता: पद्धतय:।

(b) प्रयुक्तिविद्यायां कम्प्यूटारयन्त्रविधे: प्रयोजनीयता।

(c) वेदानामपौरुषेयत्वम्।

(d) श्रीमद्भगवद्गीताया: सामाजिकत्वम्।

(e) देशाकृतिरक्षणे महाभारतस्य प्रयोजनम्।

2023

SANSKRIT

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be written either in **English** or in **Bengali** or in **Sanskrit**, but all answers must be in one and the same language, unless otherwise specified.*

Group-A

1. Write in brief the social condition as reflected in *Brāhmaṇa* literature. Mention the scripture of *Āraṇyaka* which may be differed from the *Brāhmaṇa*. 12½+12½=25

Or,

Trace the growth and definition of *Sūtra* literature. What is total number of *Sūtras*? Give a brief account on the development of this literature as laid down in *Vedāṅgas*. 5+5+3+12=25

2. Narrate the influence of the *Rāmāyaṇa* at the post literature of Sanskrit. Among the later *Kāvyas* two books may be elaborated on their comprehensive notes. 10+7½+7½=25

Or,

Discuss the significance of plays at Sanskrit dramatic literature as role of *Bhavabhūti*. Write a salient feature on works of such a dramatist. 12½+12½=25

3. What are the germs of orthodox views on Indian Philosophy? Amidst them, heterodox systems in India may be placed on philosophical dogmatic idea. 10+15=25

Or,

Critically examine the philosophical thought on the scientific process of India. Discuss two orthodox systems in views of authoritative knowledge. 10+7½+7½=25

4. Estimate technical occupation of Indians at the then Indian Society. What are the life styles as narrated in literary era? 12½+12½=25

Or,

Write a comprehensive note on *two topics* as Chandas and Medicinal Works of India. Show some works with reference to the study of astronomy. 6+6+13=25

Group-B

5. Critically analyse on acquaintance of *Kālidāsa's* natural view as so reflected in the *Abhijñāna-śakuntalam*. Discuss his poetic nature fully in aforesaid dramatic work. 12½+12½=25

Or,

Critically examine *Bhavabhūti's* treatment on his play *Uttararāmacarita*. Discuss the artistic perception revealing in his work on Rhetoric affairs likely Rasa-theory in brief. 12½+12½=25

6. Discuss the significance of connotation on the *Kumārasambhava* of *Kālidāsa*. Narrate the episode about its Canto-V. 10+15=25

Or,

Mention briefly the feature *भारवेरर्थगौरवम्* after the citation from *Bhāravi's Kirātārjunīyam*. Show the justification on the term *अर्थगौरवम्* grammatically. Why is called *Bhāravi's* work similar to the juice of coconut fruit akin to its poetic value? 10+5+10=25

7. Analyse briefly the Royal pieties as reflected in the *Manusaṁhitā's* Chapter-VII. Why is called the *Saṁhitā* laid by Manu at Indian scripture? 15+10=25

Or,

Summarise the Chapter VII of the *Manusaṁhitā*. What are the verses of this chapter? Mention specially a *Śloka* to discuss among the diverse verses. 10+5+10=25

8. Why is so-called *Īśāvāsyopaniṣad*? To which Veda this *Upaniṣad* belongs? What is significance for connotation of it? How many verses are there? Trace the philosophical themes of this *Upaniṣad*. 8+2+5+3+7=25

Or,

Analyse the thought of the *Īśāvāsyopaniṣad*. Name another title of this *Upaniṣad*. In which recension of the Veda this text is included? Estimate the importance of *Upaniṣadic* branch at the philosophical doctrines of schools in India. 8+2+4+11=25

2023

PHYSIOLOGY

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any six* questions.

1. (a) What is isoelectric pH? State its significance.
   (b) Discuss briefly the glass-electrode method of pH determination.
   (c) Write name of the different blood buffer system.
   (d) Describe briefly the role of blood buffer system in maintaining blood pH. (2+3)+6+3+6=20

2. (a) What is osmosis? Why osmosis is important to the survival of cell?
   (b) What type of pressure is osmotic pressure? Describe the factors affecting osmotic pressure.
   (c) Explain briefly Van't Hoff law of osmotic pressure.
   (d) What do you mean by dialysis and ultrafiltration? (2+3)+(2+3)+6+(2+2)=20

3. (a) What is glycogenin? What does it play in glycogen metabolism?
   (b) What is anomer? State the different anomeric form of glucose.
   (c) Why glucose is called dextrose? Why sugar are most powerful reducing agent in alkaline medium?
   (d) Distinguish between the chemical structure of starch and cellulose. What is sugar acids? (2+3)+(2+3)+(2+3)+(3+2)=20

4. (a) What is 'Cahill Cycle' pathway? State its physiological importance.
   (b) What is transmethylation? Give one example.
   (c) What do you mean by essential and non-essential amino acids? Give suitable examples.
   (d) Why arginine is called semi-essential amino acid?
   (e) What is the principle of 'protein denaturation'? (3+3)+4+4+3+3=20

5. (a) Calculate the total energetics of β-oxidation reaction of one molecule of fatty acid (palmitic acid).

   (b) What are the sources of NADPH and acetyl CoA for lipogenesis?

   (c) How do phospholipid differ from triglyceride?

   (d) Distinguish between fat and wax. 6+(4+4)+4+2=20

6. (a) Explain how lanosterol is formed from squalene.

   (b) Why the pentose phosphate pathway is called hexose monophosphate shunt (HMP shunt)?

   (c) How are H_2O_2 and superoxide radicals formed in cells? How do they cause cell damage?

   (d) Describe the anabolic role of TCA cycle. 6+2+(4+2)+6=20

7. (a) Describe the rate-limiting steps of the glycolytic pathway.

   (b) How can hexose sugars enter the glycolytic pathway?

   (c) What do you mean by galactosemia? 8+8+4=20

8. (a) Describe the biosynthesis of Nitric oxide (NO) in our body.

   (b) What are the difference between glucogenic and ketogenic amino acid.

   (c) Name the ketone bodies. Describe the formation and fate of ketone bodies in human system.

   (d) What is tautomerism? Give one example. 4+4+(3+7)+2=20

9. (a) What do you understand by recombinant DNA? Write two uses of recombinant DNA technology.

   (b) Describe the inborn errors of phenylalanine and glycogen metabolism.

   (c) What is ribose sugar?

   (d) What are fibrous protein? State the differences between fibrous protein and globular protein. (3+3)+(3+3)+2+(2+4)=20

10. (a) What do you mean by protein calorie malnutrition (PCM)? State their social implications.

    (b) What do you understand by protein sparing effect of glucose?

    (c) Describe the nutritional anemias with their causes and hematological changes.

    (d) What are positive and negative nitrogen balance? (2+2)+4+(4+4)+(2+2)=20

Group-B

Answer *any four* questions.

11. (a) Discuss the role of erythropoietin on erythropoiesis.
    (b) What do you mean by turbulant and laminar flow?
    (c) What is Reynolds number? "Higher the value of Reynolds number, greater the possibility of turbulance"— Justify the statement.
    (d) What do you mean by homeostasis? Why blood cell does play the most important role in the maintenance of homeostasis? 4+4+(2+4)+(3+3)=20

12. (a) Define antibiotics. Why penicilline is the safe antibiotic for human body?
    (b) What are allergens? Name the antibody secreted during immune response in allergy.
    (c) "All immunogens are antigen but all antigens are not immunogens."— Explain why? What is epitope?
    (d) What are the difference between plasmid DNA and regular DNA?
    (e) Describe with diagram the structure of bacteriophase. (2+2)+(2+2)+(2+2)+4+4=20

13. (a) Describe the functions of plasma protein in human body. What is plasmapheresis?
    (b) What do you mean by iron overload disease?
    (c) What do you know about procoagulants and anticoagulants? State their mechanism of action.
    (d) Write down the chemical structure of hemoglobin. (4+2)+2+(4+4)+4=20

14. (a) Describe the physiological significance of PR-interval in ECG.
    (b) What do you mean by exploring electrode and indifferent electrode used to measurement of ECG?
    (c) What do you understand about slow diastolic depolarisation phase of the hearts?
    (d) Distinguish between capacitance and resistant blood vessels.
    (e) State Fick's Principle in the measurement of cardiac output. 4+4+4+4+4=20

15. (a) State the importance of spirometry in the diagnosis of respiratory disease.
    (b) What do you mean by ventilation-perfusion ratio?
    (c) What is the significance of alveolar surfactant?
    (d) Discuss the non-respiratory functions of lungs.
    (e) What is emphysema? 6+4+2+4+4=20

16. (a) Describe with suitable diagram the ultra-structure of nephron. What is podocytes?
    (b) Discuss the mechanism of reabsorption of glucose through renal tubule.
    (c) Compare and contrast the functions of internal and external urethral sphincters.
    (d) What is aquaporin? (6+2)+6+4+2=20

2023

PHYSIOLOGY

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any six* questions.

1. (a) What is end plate potential (EPP)?
   (b) How does an end plate potential lead to an increase in Ca^{++} concentration in the Sarcoplasm?
   (c) Describe the role of ATP in the power and recovery strokes of Myosin head.
   (d) How does the contracted muscle fibre return to its resting length?
   (e) What are the causes of Muscle fatigue? 2+4+6+4+4=20

2. (a) Distinguish between resting membrane potential and action potential.
   (b) Explain why the force of muscle contraction depends on the length of the muscle prior to stimulation.
   (c) What will happen after injection of 'acetylcholine-esterase (AchE)' into the muscle?
   (d) State the functions of glycogen and myoglobin present in the Sarcoplasm.
   (e) What is Sarcopenia? 6+4+2+4+4=20

3. (a) Discuss the process of Wallerian degeneration of nerve fibre.
   (b) Distinguish between contransmitter and neuromodulator.
   (c) What are glial cell? State their functions.
   (d) What is Hursh Factor? 6+(2+2)+(4+4)+2=20

4. (a) What do you understand by ganglion? What are the differences between prevertebral and paravertebral ganglia?
   (b) What is diffuse thalamocortical projection system? Discuss its role in the induction of sleep and wakefulness.
   (c) Describe the fluent and non-fluent aphasias. (2+4)+(2+4)+(2+6)=20

5. (a) What are anterograde and retrograde amentia?

   (b) What is operant conditioning?

   (c) Describe with a neat diagram the origin, course and termination of Pyrimidal track. State the functions of Pyrimidal track. (2+2)+4+(8+4)=20

6. (a) Why gustation is called special sense?

   (b) Describe the structure of taste bud with neat diagram.

   (c) Describe the neural pathway of gustatory sensation with appropriate diagram.

   (d) What is agensia? 4+6+6+4=20

7. (a) What is Steven's power law?

   (b) What do you understand by tonic and phasic adaptations of receptors?

   (c) Describe the structure of an Olfactory bulb with labelled diagram.

   (d) What is Umami sensation?

   (e) What is electro olfactogram? 4+4+6+2+4=20

8. (a) Describe the physiological basis of discrimination of sound frequencies and intensities.

   (b) State the functions of middle ear.

   (c) What is tip link?

   (d) What is deafness? 8+6+4+2=20

9. (a) What is pyrexia? How does it develop?

   (b) What is non-shivering thermogenesis?

   (c) What do you mean by hypothermia and hyperthermia?

   (d) Discuss the causes and prevention of hypothermia.

   (e) How does ecrine sweat gland differ from apocrine sweat gland? (3+3)+2+4+4+4=20

10. (a) Describe the chemical changes that occur in the rhodopsin molecule on exposure to light.

    (b) What do you mean by "On center" and "Off center" ganglion cells in the retina?

    (c) What do you understand by colour blindness? Describe the different types of colour blindness.

    (d) What is glaucoma? 8+4+(2+4)+2=20

Group-B

Answer *any four* questions.

11. (a) Write the principle of physical training.
    (b) What are overtraining and detraining?
    (c) Describe the effects of long term physical training on skeletal muscle.
    (d) Describe the basic concept of lactate threshold and lactate tolerance.
    (e) What do you mean by isotonic and isometric work? Give example. 2+4+6+4+4=20

12. (a) Describe breifly the physiological functions of growth hormone.
    (b) What are the hypothalamic releasing factors? State their functions on anterior pituitary.
    (c) How the posterior pituitary hormones are transported from their site of synthesis of the hypothalamus to their site of release at pituitary?
    (d) State the origin and functions of somatomedian. 6+(2+4)+4+4=20

13. (a) T_3 is more potent than T_4.—Discuss with reason.
    (b) Describe the role of pendrin and megalin protein on thyroid hormone biosynthesis.
    (c) What are the differences between calcitriol and calcitonin?
    (d) What do you mean by Type I and Type II diabetic mellitus?
    (e) Why ketosis develops in diabetes mellitus?
    (f) What do you mean by Insulin Shock? 2+4+4+4+4+2=20

14. (a) Discuss the source and functions of Minerellocorticoids.
    (b) What are the adrenal medullary hormones? Describe the role of adrenal medullary hormone in the regulation of stress.
    (c) What is pheochromocytoma? State its symptoms. (1+6)+(3+4)+(2+4)=20

15. (a) Describe with suitable diagram the histological structure of an ovary.
    (b) What is menopause? Describe the post-menopausal physiological changes in female.
    (c) Name the accessory sex organs in male.
    (d) How many spermatoza are produced from spermatogonia?
    (e) What is blood testis barrier? 5+(1+4)+4+2+4=20

16. (a) Name the diseases that can be controlled by immunization programmes.
    (b) What are the social importance of immunization against disease?
    (c) Discuss the measures that could be taken for prevention of hepatitis.
    (d) Discuss briefly the non-auditory effect of noise on human body.
    (e) What are the principles of family planning? 4+6+3+4+3=20

2023

PHYSICS

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and same language.*

Group-A

Answer *any three* questions.

1. (a) A frame of reference rotates with uniform angular velocity $\bar{\omega}$. For this frame, establish the identity $\frac{d}{dt}=\frac{d'}{dt}+\bar{\omega}\times$.

Hence, obtain expressions for centrifugal force and Coriolis force for the motion of a particle with respect to the rotating frame.

(b) The equation of an orbit of a particle moving under a central force is $r=a(1+\cos\theta)$, a being constant. Find the nature of the force.

(c) Show that for a system of particles the total energy is conservative when internal and external forces are conservative.

(d) Writing $r=\frac{1}{u}$, show that the conservation of energy equation for central force becomes $\left(\frac{du}{d\theta}\right)^2+u^2=\frac{2(E-V)}{mh^2}$

(e) Find the gravitational attraction between the two hemispherical halves of a solid sphere. (4+4+4)+6+4+10+8

2. (a) Consider a pendulum made of a spring with a mass m on the end. The spring is arranged to lie in a straight line (which we can arrange by, say, wrapping the spring around a rigid mass less rod). The equlibrium length of the spring is l. Let the spring have length $l + x$ (t), and let its angle with the vertical be $\theta(t)$. Assuming that the motion takes place in a vertical plane, write the Lagrangian of the system. Find the equations of motion for x and θ using Lagrangian formulation.

(b) A symmetric top, with one point fixed, is rotating about the axis of symmetry. Obtain the total energy of the system.

(c) Show that a bar supported horizontally at the two ends and loaded in the middle can be considered as a double cantilever. Hence derive an expression for the depression of such a bar at the centre.

(d) Find the moment of inertia of two masses m and M about an axis passing through centre of mass and perpendicular to the line joining between them. (Take the distance between m and M as d).

(e) A rocket starts falling vertically from rest under gravity. When it starts falling, the gas ejected from the rocket at constant rate α maintains a speed v_0 w.r.t. the motion of the rocket. Determine the speed of the rocket and the distance travelled by it after time Δt. Given that M_0 is the initial mass of the rocket. (3+7)+4+(3+8)+6+(3+6)

3. (a) Derive relativistic velocity addition theorem.

(b) For a particle of rest mass m_0 and momentum p, show that the kinetic energy is given by,

$$E = \sqrt{p^2c^2 + m_0^2c^4} - m_0c^2$$

(c) Define proper time interval and show that it is a Lorentz invariant quantity.

(d) In a certain inertial frame light pulses are emitted by two sources 5 km apart. Time interval between two pulses is 5 μs. An observer moving at a speed V along the line joining these sources notes that the pulse are simultaneous. Find the speed V of the observer.

(e) A particle is subjected to two SHMs at right angles to each other having the same frequency. Show that the resultant locus of the particle is an ellipse. Hence find the locus when the two motions are in phase and in the opposite phase.

(f) Derive the relation between phase velocity and group velocity of wave.

4+6+(2+6)+8+(6+2+2)+4

4. (a) What is the Basis of Fermat's principle? Using this principle obtain the laws of refraction considering refraction from a plane surface.

   (b) Define Zone plate. Find an expression for its primary focal length.

   (c) What is meant by spherical aberration of a lens? Show that the condition for minimum spherical aberration is that the distance between two lenses are equal to the diffeence in their focal lengths.

   (d) Obtain the expression for the intensity of Fraunhofer diffraction pattern due to double slit.

   (e) The radius of curvature of the convex surface of a plano-convex lens is 30 cm. The lens is placed with its convex side down on a plane glass plate and illuminated from above with red light of wavelength 650 nm. Find the diameter of the third bright ring in the interference pattern. (3+9)+(2+4)+(3+6)+7+6

5. (a) State and prove Gauss's theorem in electrostatics.

   (b) A point charge q is placed at a distance d from the centre of a conducting sphere of radius a maintained at zero potential ($d > 0$). Find the location and magnitude of the image charge.

   (c) Define an electric dipole. Obtain the expression for the electrostatic potential at a point due to an electric dipole (of dipole moment $\vec{p}$).

   (d) Find the expression for the electric field due to an infinite plane sheet of charge (of uniform surface charge density σ) and show that it is independent of the distance from the sheet.

   (e) State Biot-Savart law. Starting from Biot-Savart law show that $\vec{\nabla}.\vec{B} = 0$.

   (f) Show that the electric field vector can be written as $\vec{E} = -\vec{\nabla}\phi - \frac{\partial \vec{A}}{\partial t}$, in case of a time varying electromagnetic field, where ϕ and $\vec{A}$ are the scalar and vector potentials respectively. 5+6+(2+5)+(5+3)+(2+5)+7

6. (a) A series LR circuit has complex impedance $\sqrt{(3+j)\,\Omega}$. If an alternating source of emf of 10 V is applied across it, calculate the power consumed by the Circuit. Consider a parallel L-C combination in series with a resistance R. Calculate the output voltage across L-C combination for sinusoidal input.

(b) What is Joule-Thomson effect? Distinguish between free expansion and Joule-Thomson expansion.

(c) Prove the relation $\left(\frac{\partial U}{\partial V}\right)_T = T\left(\frac{\partial P}{\partial T}\right)_V - P.$

(d) Liquid helium has a normal boiling point = 4·2 K. However, at a pressure of 1 mm of mercury, it boils at 1·2 K. Estimate the average latent heat of vaporization of helium in this temperature range (Take the volume in the liquid state << volume in gaseous phase).

(e) For a thermodynamic system, show that $TdS = C_V dT + \frac{\beta T}{K_T} dV$, where β and K_T are volume expansivity at constant temperature and isothermal compressibility, respectively.

(2+8)+(2+4)+6+8+10

Group-B

Answer *any two* questions.

7. (a) If the Lagrangian is given by $L(x,\dot{x}) = \frac{\dot{x}^2}{2x} - V(x)$, what will be the corresponding Hamiltonian.

(b) A cylinder of length l and radius a is stretched such that the volume of the rod is not changed. Show that the Poisson's ratio is $\frac{1}{2}$.

(c) Obtain an expression for the height h through which a liquid of surface tension S will rise in a capillary tube of radius r.

(d) How the coefficient of viscosity is influenced by temperature? A liquid of coefficient of viscosity η flows steadily through a cylindrical tube of radius 'a' and length 'l'under a pressure 'P'. Show that its velocity at a point inside the tube at a distance r from its axis is $v = \frac{P}{4\eta l}(a^2 - r^2)$.

(e) What was the objective of the Michelson-Morley experiment? Discuss its conclusions. An observer on a railway platform sees two trains are approaching each other at a speed of $\frac{7}{5}C$. An observer on one train sees the other train is approaching him with a speed of $\frac{35}{37}C$. What are the velocities of the trains relative to the observer on the platform?

8+5+6+(2+8)+(3+8)

8. (a) The density inside a solid sphere of radius a is given by $\rho = \rho_0^{a/r}$, where ρ_0 being the density at the surface and r the distance from the centre. Find the gravitational field due to the sphere at a distance $2a$ from its centre.

(b) A particle is simultaneously under two simple harmonic motions at right angles to each other, represented by $x = a \sin \omega t$ and $y = b \sin (\omega t + \delta)$

(i) Show that the resultant motion is represented by,

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{2xy}{ab} \cos \delta = \sin^2 \delta$$

(ii) What will be the locus of the particle when $\delta = \pi/2$ and $a = b$?

(c) In Young's double-slit experiment, the slits are repeated at 0·24 mm. The screen is 1·2 m away from the slits. The fringe width is 0·03 cm. Calculate the wavelength of light used in the experiment?

(d) Which one is more melodious—a struck string or a plucked string? Explain your answer. Find the ratio of amplitudes of the fundamental and the next harmonic excited in a string struck at the mid-point. 10+(6+4)+8+(2+2+8)

9. (a) State Biot-Savart's law for the magnetic field due to a current element and use it to obtain the magnetic field due to an infinite thin straight wire carrying current I.

(b) Find the force between two straight, infinite parallel wires carrying current I_1 and I_2, separated by a distance d and placed in air.

(c) A battery of 6 volt and internal resistance 0·5 ohm is joined in parallel with another battery of 10 volt and internal resistance 1 ohm. The combination sends a current through an external resistance of 12 ohm. Draw the circuit diagram and find the current through each battery.

(d) Deduce, in henries, the value of the self-inductance in the air medium of a circular coil of radius 'a' and 'n' number of turns.

(e) Calculate the volume and surface charge density of a sphere of radius R carrying a polarization $\vec{P}(\vec{r}) = k\vec{r}$, where k is a constant and $\vec{r}$ is the vector from the centre.

(f) The potential at the surface of a sphere with no charge inside or outside is given by $V_0(\theta) = k\cos(3\theta)$, where k is some constant. Find the potential inside and outside the sphere and the surface charge density $\sigma(\theta)$. (3+6)+5+5+(2+5)+6+8

10. (a) Explain why a 'displacement current' had to be added to make Maxwell's equations consistent.

(b) Staring from Maxwell's equations, set up the energy conservation equation in an electromagnetic field.

(c) An alternating e.m.f. $E = E_0 \sin \omega t$ is applied to the ends of circuit consisting of a resistor R and a coil of self-inductance L in series. Deduce an expression for the current in the circuit. How does the current differ in phase from the applied e.m.f. in the above circuit?

(d) A piece of some material is placed in a non-uniform magnetic field. What would you observe if the material is (i) diamagnetic and (ii) paramagnetic?

(e) From Clapeyron equation show that increase of pressure raises the boiling point of a liquid.

(f) Show that $C_V = -T\left(\frac{\partial^2 F}{\partial T^2}\right)_V$

(g) Deduce Maxwell's 2nd and 3rd thermodynamic relations using Jacobian relations.

4+6+(4+6)+(2+2)+6+5+5

2023

PHYSICS

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any six* questions.

1. Consider three particles each of which can be in one of three quantum states of respective energies $0, \in$ and $3\in$. The system is at a temperature = $(k\beta)^{-1}$. Write the partition function Z if the particles obey classical *MB* statistics and are distinguishable. Find also Z if the particles obey *B-E* statistics. 5+5

2. Three containers, each of volume V, contain N particles of a classical, a Bose and a Fermi gas respectively at the same temperature T. State with reason which of the three containers will have the highest pressure. 10

3. The phase space of a one-dimensional single particle is described by its coordinate q and momentum p. Consider a rectangular phase space volume between $= q_1, q = q_2, p = p_1$ and $p = p_2$. Show that in the simple case of a free, non-interacting particle, the phase space volume remains invariant in time. 10

4. State the differences between depletion type and enhancement type MOSFET. Draw $I_D - V_{gs}$ transfer characteristics of depletion type MOSFET. 5+5

5. Differentiate between *n-type* and *p-type* semiconductor. Draw and explain the transfer characteristics of a BJT in common emitter mode. 5+5

6. (a) What is meant by 'cross-section' of a nuclear reaction? Calculate the threshold energy of the reaction $^{14}N(n,\alpha)^{11}B$.

   Relevant masses are: $M\left(^{14}N\right) = 14{\cdot}007550$ amu

   $M(n) = 1{\cdot}008983$ amu

   $M(\alpha) = 4{\cdot}003879$ amu

   $M\left(^{11}B\right) = 11{\cdot}012811$ amu

(b) Explain with reasons whether the following reactions are allowed or forbidden:

(i) $p \rightarrow \pi^+ + \pi^- + e^-$

(ii) $\pi^+ + n \rightarrow \pi^0 + k^+$

(iii) $p + \pi^- \rightarrow n + \pi^0$ (2+5)+3

7. (a) Determine the ground state spin parity of $^{19}_{9}F$ in the context of single particle shell model.

(b) Show that the conservation of angular momentum is not violated in β- decay if the intrinsic spin of the neutrino is $\frac{\hbar}{2}$. 5+5

8. (a) Use uncertainty principle to calculate the radius and energy of first Bohr Orbit.

(b) The exciting line in an experiment is 546 nm and the stokes line is at 552 nm, find the wavelength of the anti-Stokes line. 5+5

9. What is the physical significance of Fermi-level in semiconductor? Sketch the Fermi-Dirac distribution function and its derivative for $T = 0\ K$ and $T > 0\ K$ showing clearly the Fermi energy. 10

Group-B

Answer *any seven* questions.

10. (a) For a system of N one-dimensional harmonic oscillators, obtain the canonical partition function and calculate the average energy.

(b) Show that the average energy of a system in contact with a heat bath can be expressed as $\langle E \rangle = -\frac{\partial \ln z}{\partial \beta}$ where Z is the partition function and $= \frac{1}{K T}$. (5+5)+10

11. (a) The entropy of an ideal gas of N monoatomic molecules occupying a volume V at a temperature T is given by,

$$S(N,V,T) = Nk \log\frac{V}{N} + \frac{3}{2}Nk\left[\frac{5}{3} + \log\left(\frac{2\pi mkT}{h^2}\right)\right]$$

Two non-identical gases having N_1 and N_2 molecules, occupying volumes V_1 and V_2 respectively, are allowed to mix quasi-statically by removing the separating wall. Find the change in entropy in this mixing process. Assume that initially, the gases are at the same temperature T and have equal number densities, i.e., $\left(N_1/V_1\right) = \left(N_2/V_2\right)$.
Also assume the mass of all gas molecules to be equal.

(b) A particle in $1D$ has energy = $\frac{p^2}{2m} + \lambda q^4$, where q and p denote the generalized coordinate and momentum, respectively. Show that heat capacity of a gas comprising of N such particle is $C_V = \frac{3}{4}Nk$. 10+10

12. (a) (i) In how many ways can 5 identical balls be distributed among 3 identical boxes where each box can contain any number of balls?

(ii) Consider a free particle inside a $1D$ box of length L. Calculate the number of microstates between the energy values E and $+ dE$.

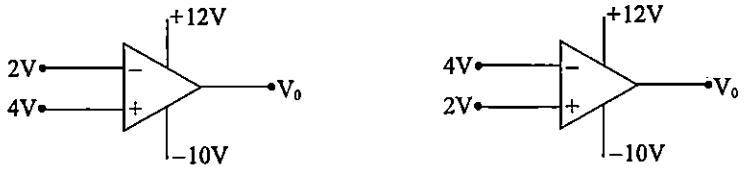
(b) (i) Derive Wein's displacement law from Plank's law.

(ii) The entropy of blackbody radiation is given by, $S = \frac{4}{3}\sigma V^{\frac{1}{4}} E^{\frac{3}{4}}$. Show that PV = $\frac{E}{3}$.

(4+6)+(5+5)

13. (a) What should be the input resistance, output resistance and voltage gain of an ideal OP AMP? Calculate the voltage gain of an inverting OP AMP.

(b) Find out the output voltage of the following two circuits: (6+6)+8



14. (a) (i) Verify the Boolean identity: $AC + ABC = AC$

(ii) Verify the Boolean identity: $A + \overline{A}B = A + B$

(iii) Show that $\overline{AB} + \overline{A} + AB = 1$

(b) Implement the Boolean function $Y = AB + \overline{A}C$ using only NAND gates.

(c) Draw the circuit diagram of two input AND gate with the help of diodes and write the truth table of it. (3+3+3)+5+6

15. (a) What is basic difference between a nuclear reactor fission and a nuclear fission bomb? Explain with example the action of Moderator and control rods in a fission reactor.

(b) Use the semi empirical mass formula to construct the mass-parabola for isobars having same mass number A. Hence find an expression for the most stable isobar. Illustrate your answer by a suitable plot of $M(A, Z)$ against Z. (4+3+3)+(6+2+2)

16. (a) Consider the one-dimensional problem of a particle in a box, i.e., a particle placed in a potential:

$V(x) = 0$, for $0 < x < L$

$= \infty$, otherwise.

Evaluate the $x - p$ uncertainty product $(\Delta x)^2 (\Delta p)^2$, for the ground state.

(b) The initial (r = 0) wave function of a free particle is described by the Gaussian wave packet

$\psi_0 = Ae^{-\alpha x^2}$, where A and α are constants.

(i) Normalize the wave function $\psi_0(x)$.

(ii) Find the wave function $\psi(x, t)$ of the free particle at a later time t.

(iii) Calculate the probability density and hence show that the wave packet of the free particle broadens spatially with time.

(iv) Plot the probability density at time $t = 0$ and time $t > 0$ with x.

8+(3+3+3+3)

17. (a) Find the degeneracy of an energy level with principal quantum number n for a hydrogen atom.

(b) Define group velocity. Show that group velocity of a wave packet is equal to the velocity of a particle. Using the definition of expectation value of an observable, show that $\frac{d\langle x\rangle}{dt} = \frac{\langle P_x\rangle}{m}$, where the symbols have their usual meanings. 8+(2+4+6)

18. (a) What do you mean by *LS*– and *jj*-coupling? When do they occur? Irradiation of CCl_4 by 435·8 nm radiation yields Raman lines at 440·0, 441·9 and 444·7 nm. Calculate the Raman shift for line in the middle.

(b) What do you mean by 'population inversion'?

(c) Find the ratio of the rate of spontaneous and stimulated emission in terms of frequency and temperature.

(d) Draw the energy level diagram of ruby laser. (2+2+4)+4+4+4

19. (a) Consider a particular energy band, which is filled with electrons up to the value $k = k_1$. Show that the effective number of free electrons in the band is directly proportional to the slope of the E – k diagram $\left(\frac{dE}{dk}\right)_{k=k_1}$.

(b) Explain why the electronic specific heat associated with a free electron gas is negligibly small. What are the various contributions to the specific heat of a solid? Use Debye theory of specific heat to establish the famous Debye T^3 law. 6+(4+4+6)

2023

PHILOSOPHY

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and same language.*

Answers any five *questions taking at least* two *questions from each group.*

Group-A

1. Evaluate Aristotle's view of 'four varieties of cause'. Explain in this connection the importance of the distinction between 'the potential and the actual'. 25+15

2. Is synthetic a *priori* judgement possible? Justify your answer after Kant. 40

3. Explain and examine Hume's view of causation as a relation of 'constant conjunction'. 40

4. Write notes on *any two* of the following: 20×2=40
   (a) Moore's defence of common-sense
   (b) Spinoza's view on substance
   (c) Berkeley's view on God
   (d) Descartes method of doubt

Group-B

5. Explain Cārvāka critique of inference. What is its bearing on Cārvāka metaphysics? Discuss. 25+15

6. Explain and examine the main issue of the Buddhist view of momentariness. 40

7. Explain and examine the main feature of Jaina view of Anekānta. How is it related to saptabhaṅgi-naya? 25+15

8. Write notes on *any two* of the following: 20×2=40
   (a) Samavaya (Vaiśeṣika)
   (b) Samkhya view of causation (satkāryavāda)
   (c) Involution and Evolution (Sri Aurobindo)
   (d) Śaṅkara's view on Māyā

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PHILOSOPHY

PART-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and same language.*

Answer any five *questions taking at least* 2 *questions from each group.*

Group-A

(Socio-political Philosophy & Psychology)

1. Write a critical essay on Justice as a political ideal with special reference to the principle of equality. 25+15

2. How does Gandhi want to bring social change through Sarvodaya? Is it feasible? Justify your answer. 25+15

3. "Rights and Duties are integrally related and the one is meaningless without the other."— Explain the view in the context of relation between Individual and State. 40

4. Write notes on *any two* of the following: 20×2=40
   (a) Scientific socialism
   (b) Secularism and India
   (c) Person theory of Strawson
   (d) Philosophical Behaviourism in the context of mind-body problem

Group-B

(Ethics and Philosophy of Religion)

5. Explain the main issue of Religious Pluralism. 40

6. Explain and examine the Nyaya Proof for the existence of God. 40

7. What is Environmental Ethics? Distinguish between Bio-centric and Eco-centric Ethics. 40

8. Write notes on *any two* of the following: 20×2=40
   (a) Liberal and Radical Feminism
   (b) Brahma-vihara (Buddhism)
   (c) Analogical nature of religious language
   (d) Anubrata (Jainism)

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PERSIAN
PAPER-I

Time Allowed—3 Hours *Full Marks—200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.
Answer may be given either in ***English*** *or* ***Persian*** *unless otherwise mentioned in the question.*

Group—A

Attempt *any two* of the following questions:

1. Discuss the important steps towards the decipherment of the Persian cuneiform inscriptions. 25

2. Give an account of various stages of the development of Persian language. 25

3. Write notes on the following: 8+8+9=25
   (a) Ghatas
   (b) Zand Avesta
   (c) Pazand

Group —B

Attempt *any four* of the following questions:

4. Give the opposite number of *any five* of the following: 2×5

   قول - بدن - روح - ملائک - اولیاء - سلطان - اشعار - یوم

5. Illustrate with example *any two* of the following: 5×2

   اسم اشاره - صفتِ تفضیلی - ضمیر متصل -فعل متعدی

6. Explain the formation of *any five* of the following: 2×5=10

دردمند - گلزار - دید گاه - تنگدست - رزم گاه - کوهسار

7. Give the uses of ب or م. 10

8. Form words with *any five* of the following: 2×5

ناك - بخت - ترین - تان - دان - تر - کار -

Group–C

9. Translate the following passage into Persian: 30

Obaidullah Obaidi Suhrawardy was a great scholar of 19th Century Bengal. He came of a noble Iranian faimly of Sohravard. One of his ancestors migrated from Iran to India and settled in Fathabad, a village near Murshidabad, in West Bengal. Obaidi's father, Shah Aminoddin moved from Murshidabad to Midnapore. He was born on 14th September, 1834 at a village Daspur, in the district of Midnapur. After receiving his primary education in the village, he came to Kolkata and was admitted to The Madrasha Aliyah. Within a short time, Obaidi became well-versed in different branches of learning and acquired proficiency in a number of languages like Urdu, Persian, Arabic and English besides being a master of his native tongue Bengali. He composed verses in Arabic, Persian and Urdu.

Obaidi was a prolific writer and wrote about fifty two books on various subjects. Besides the Divan in Urdu and Persian, he had to his credit Dastur-e-Parsi Amuz. Meftahol-Adab and a book on fiction Dastan-i-Danish Amuz. In Enlish, the most important work was A Grammar of Arabic language. He also composed a masnavi entitled "Qelopatre va Antones" (Cleopatra and Antony) in Persian. He died in 1885 at Dhaka now in Bangladesh.

10. Translate into English, the passage given below: 30

صادق هدایت در تهران در سال ۱۹۰۳ در خانوادهٔ محترمی بدنیا آمد– نام او را برسم معمول، بزرگ خانواده مرحوم نیر الملک جدپدری هدایت"صادق" نهادند. صادق را درء سالگی به مدرسهٔ علمیه سپردند و او دورهٔ ابتدای را بدون وقفه طی کرد و بدارالفنون رفت و تا سال سوم دبیرستان در آن مدرسه به تحصیل پرداخت. سپس او را به مدرسه سن لوئ فرستادند.صادق باعلاقهٔ شدیدی به فراگرفتن زبان فرانسه پرداخت و همین که بفرانسه آشنائ پیدا کرد به مکاتبه با انجمن های ادبی اروپا پرداخت و کتابها و رساله مورد علاقه را بدان وسیله وارد می کرد.

صادق زبان فرانسه را بسیار خوب می دانست و باین زبان درست و روان می نوشت. انگلیسی راهم آنقدر می دانست که بتواند بخوبی از کتابهای علمی و ادبی این زبان استفاده بکند. اماعلاقهٔ او محدود به ادبیات بنود. به همه علوم و معارف بشری با نظر کنجکاوی می نگریست.

هدایت در سراسر زندگی خویش از جهان و ناسازگاری های آن رنج می برد و از کارهایش این رنج و اندوه بخوبی آشکار است. قهرمانان آثار هدایت، افراد زحمت کش، دهقانان، صنعت گران، کارمندان و معلمین اند.

11. Define *any three* of the following and give suitable examples. 10×3=30

تضاد- مبالغه - مذهب کلامی - صنعت عکس - تجرید -وتد مفروق—

12. Scan *any two* of the following verses and name the metre. 10×2=20

(الف) دلِ هر کس به تعظیم سخن از جانمی خیزد
قیامت گربه بالینش رسد بر پانمی خیزد

(ب) جوانی و پیری بنزد اجل
یکی داں چو در دین نخواهی خلل

(ج) سر بجیبِ فکر کن تا از فلک بیرون شوی
بر کمر زن پا چو ماه عید روز افزوں شوی

2023
PERSIAN
PAPER-II

Time Allowed—3 Hours *Full Marks—200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.
Answer may be given either in ***English*** *or in* ***Persian*** *unless otherwise mentioned in the question.*

Group-A

Attempt *any Six* questions including Question No. 7 and 8 which are compulsory.

1. Define Ghazal. Trace the origin and development of Ghazal writing in Persian. 25

2. Who is considered to be the father of Neo-Persian poetry? Give an account of his life and works and evaluate his contributions to Persian poetry. 25

3. Show your acquaintance with khwaja Hafiz Shirazi and examine the characteristic features of his poetry. 25

4. Determine the place of Nizami Ganjavi as a Masnavi writer. 25

5. Write an essay on the historical works produced during the Mongol-Ilkhanid period. 25

6. Assess the contibutions of any Persain scholar of 19th Century Bengal to Persian literature. 25

7. Explain *any four* of the following: 10×4=40

(الف) تـوانـا بـود هـر کـه دانـا بـود
ز دانـش دل پیـر بـرنـا بـود

(ب) به می سجاده رنگین کن گرت پیر مغان گوید
که سالک بی خبر نبود ز راه و رسم منزلها

(ج) آفـاق را گـردیده ام، مـهربتـان و درزیده ام
بسیار خـوبـان دیده ام، اما تو چیزی دیگری

(د) اگر عقل را اسیر شهوت و غضب گرداند، مملکت ویران شود، و پادشاه بدبخت گردد، وهلاك شود.

(و) شاعر باید که در مجلس محاورت خوشگوی بود و درمحفل معاشرت خوش روی. وباید شعر او به آن درجه رسیده باشد که در صحیفهٔ روز گار مسطور بود.

(ه) اگر خرد داری هنر آموز که خرد بی هنر چنان باشد که مردی بی جامه، وشخصی بی صورت و کالبدی بود بی جان.

8. Write notes in Persian on *any four* of the following: 15×4=60

دقیقی -عنصری- فردوسی -جامی -محمد تقی بهار - تذکرة الاولیاء - سفرنامهٔ ناصر خسرو- کیمیائی سعادت - گلستان سعدی-پیام مشرق -

2023

CIVIL ENGINEERING

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be written either in **English** *or in* **Bengali** *but all answers must be in one and the same language.*

All notations / symbols have their usual meanings, unless otherwise specified.

Group-A

Answer *any four* questions. 35×4=140

1. (a) A simply supported beam of a beam slab system rests on a support of width 450 mm. The clear span of the beam is 10.0 m. The thickness of slab is 120 mm. The depth of the beam is 480 mm below slab and width of the beam is 250 mm. The beam is reinforced with one row 32 mm diametre steel rods. The total is 25.0 kN. Calculate the maximum design shear stress in concrete.

   (b) Design a square R.C. column to resist an axial lood 400.0 kN due to dead lood and 240.0kN due to rive lood. Design the section as a short column. Use M25 concrete and steel grade 415 N/mm^2. Give neat sketch of the section.

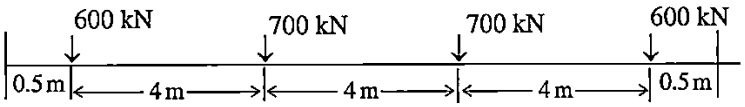
   (c) A settlement analysis carries out for a proposed structure indicates that 9 cm of settlement will occur in 5 years and final settlement will be 45 cm based on double drainage condition. A detailed site investigation indicates that only single drainage exists. Estimate the settlement at the end of 5 years. 10+10+15

2. (a) Two identical specimens were tested in a triaxial. The specimen failed at a deviator stress of 770 kN/m^2 and 1370 N/mm^2 respectively. Where the cell pressure is 200 kN/m^2 and 400 kN/m^2. Determine the value of 'C' and ϕ analytically. If the same sample is tested in a direct shear with normal stress of 600 kN/m^2. Find shear stress at failure.

   (b) (i) Discuss the assumptions of Terzaghi bearing capacity theory.

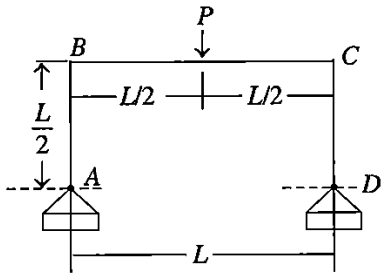
   (ii) Calculate the ultimate bearing capacity of strip footing 1.5m wide resting on a clay ($c = 30$ kN/m^2, $\gamma_{sat} = 20$ kN/m^3). Depth of the foundation 2.0 blow ground level. The water table also below 2.0 m ground. If the water table rises by 1.0 m, calculate the percentage reduction in the ultimate bearing capacity. 18+3+14

3. (a) Draw B.M and SF diagrams of the beam shown in the Figures.



(b) Discuss what do mean M_{25} concrete and Fe 415 grade of steel. 27+8

4. (a) Arrive the bending moment diagram for the frame loaded is shown using the moment distribution method.



(b) A 140mm × 10mm mild steel plate is lap spliced with 140mm × 12mm using 4 nos of 20mm mild steel bolts in clearance holes located in two rows. Calculate the load carrying capacity of the splice given that the allowable stresses

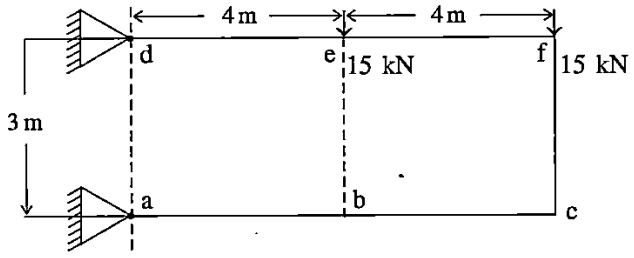
(i) Shear in bolt = 80 MPa

(ii) bearing stress in bolt = 250 MPa

(iii) Tensile stress in bolt = 120 MPa

(c) Calculate the design moment capacity by the limit states method of a rectangular concrete (reinforced) beam of 230 mm (width) × 400 mm (depth) with 3 No. of 16 mm ϕ bar Fe415 as tension reinforcement. Take clear cover 25 mm and grade concrete to be M20. 15+10+10

5. (a) Compute the forces in the members of stress shown below in Figure.



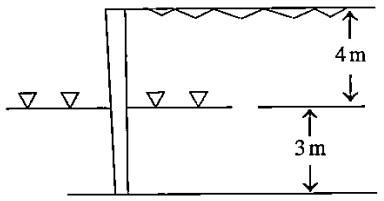
(b) A sheet of water of thickness 1m is available to fill the voids of cohesionless soil to a degree of saturation of 80%. The void ratio of the soil is 0.5. Determine the thickness of the soil layer required to accommodate this amount of water. 28+7

Group-B

Answer *any four* questions. 15×4=60

6. A cohesionless soil with a void ratio of $e = 0.6$ and specific gravity of soil solids $G_s = 2.65$ exists at a site where the water table is located at a depth of 2.0 m below the ground surface. Assuming a value of co-efficient of earth pressure at rest $K_0 = 0.5$. Calculate the following quantities at a depth of 5.0m below the ground surface: total stresses σ_V and σ_H, effective stresses σ_V^1 and σ_H^1 and pore water pressure U. Assume soil dry above the water table and saturated below the water table. Use $\gamma_w = 9.81$ kN/m^3. 15

7. (a) Plot (not to scate) the active earth pressure distribution on the retaining wall with magnitude shown by Rankinne's earth pressure theory for the data given below. Take $\gamma_w = 10$ kN/m^3.



Stratum I $\gamma = 16.2$ kN/m^3
$c = 15$ kN/m^2
$\phi = 26°$

Stratum II $\gamma_{sat} = 20.4$ kN/m^3
$\phi = 34°$

(b) Discuss earth pressure at rest, active and passive. 9+6

8. A rectangular beam 450 mm wide is subjected to bending moment 5000 kgm, a shear force of 3000 kg and torsion of 2300 km. Design the section use M25 concrete and Fe415 steel bar. 15

9. A 10m high cutting has a slope of 40° to horizontal. The properties of soil as e(void ratio) = 0.81 $c = 2.5$ t/m^2 and $\phi = 14°$ respectively. Determine the factor of safety with respect to cohesion against failure of slope

(i) when water level rises upto full height.

(ii) when water level goes down suddenly.

Given G = 2.67, for 40° slope values the stability number for different values of ϕ :

ϕ	N
6°	0.122
7°	0.116
14°	0.074

15

10. (a) Define

(i) Relative consistancy

(ii) Thixotropy

(iii) Toughness index and

(iv) stoke's law

(b) What was the absolute density and shrinkage limit of a fully saturated clay sample which had moisture content of 32% and an apparent specific gravity of 1.87, which came down to 1.77 after oven drying? 8+7

2023

CIVIL ENGINEERING

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any four* questions. 32×4=128

1. (a) Discuss the resource smoothing and allocations.

   (b) The techniques of CPM and PERT for resource smoothing the load.

   (c) Discuss the following with examples (i) Looping and Dangling in network activities (ii) Dummy activity in network (iii) Float of an activity (iv) Slacks of events.

   (d) Draw network and find the critical path and its standard deviation. From specifications of a project from a construction company, PERT network along with 3 times (a, m, b) estimate in week were found out from table shown below: 4+4+8+16

Activity	**Estimated Times**		
(ij)	**a,**	**m,**	**b**
1-2	2,	4,	7
2-3	1,	1,	2
3-5	1,	2,	3
5-7	3,	5,	6
7-9	4,	6,	10
9-10	5,	7,	10
10-11	1,	1,	2
2-4	2,	4,	5
4-6	1,	2,	3
6-8	7,	10,	13
8-10	4,	7,	9

2. (a) What are the tests to which a stone should be subjected before it is selected for building purposes?

   (b) Define water cement ratio. How does it influence concrete strength? What do you mean workability of concrete?

   (c) What are the corrections needed in linear measurement? Discuss them.

   (d) What is the basic principle in photogrammetry?

   (e) Draw a neat horizontal and vertical cross-section of a highway.

   (f) Discuss distortion of a photograph. 4+6+6+4+6+6

3. (a) What do you mean remote sensing? What do you mean by spectral response curve? How you can find out a typical spectral reflectance curves? Discuss a remote sensing programme, its advantages and limitations.

   (b) Discuss illuminance of any photograph. What are the factors which depends on illuminace of a photograph.

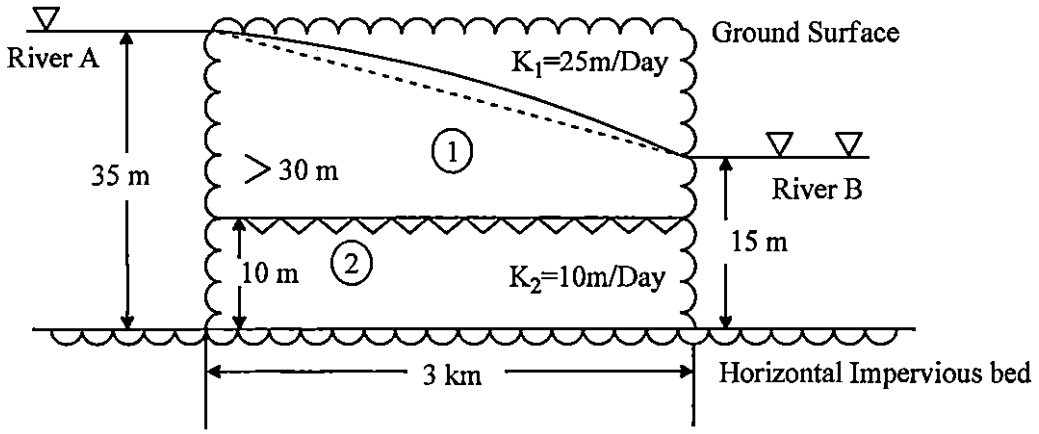
   (c) How do you find out the scale of a photograph? What are the different types of scale in photography?

   (d) A photographic film is optimally exposed with an f-stop setting of f-4 and a shutter speed of $\frac{1}{500}$ sec. What is the correct f-stop setting if shutter speed is changed to $\frac{1}{1000}$ sec? 12+6+4+10

4. (a) What do you mean by transition curve? Name different types of transition curves and its used.

   (b) Determine the ultimate B.O.D. of a waste water sample which was subjected to the B.O.D. determine as follows 6ml of waste water containing no dissolved oxygen (D.O.) was mixed with 294ml of dilution water containing 8.6mg/litre of D.O. After incubation at 20°C for 5 days, the D.O. of mixture was 5·4mg/L. The B.O.D. rate constant K to the base e is (– 0.217).

   (c) Two parallel rivers A and B are separated by a land mass as shown in Fig. below. Estimate the seepage discharge from river A to river B per unit length of the rivers. 6+11+15



5. (a) Design an irrigation channel in alluvial soil according to Lacey's Silt theory for the following data: (i) Full Supply discharge = 50 m^3/s (ii) Lacey's Silt factor = 1.0 (iii) Side slope = 1 : 2

(b) Design a rectangular sedimentation tank to remove spherical particles of size equal to and greater than 50 μm (micrometer) with specific gravity of 2.3 from 100 WMLD (million litre/day) of turbid water. Also determine the detention time of the tank. Assume (i) stoke's law (ii) length to width ratio is 3 : 1 for the tank (iii) depth of tank is 3.0 m (iv) kinetic viscosity of water is $1.01 \times 10^{-6} m^2/sec$. 17+15

Group-B

Answer *any two* questions. 36×2=72

6. (a) Draw a sketch of flexible pavement cross-section and show the component parts. Enumerate the functions and importance of each component of the pavement.

(b) What are the various factors to be considered in pavement design? Discuss the significance of each.

(c) What is a unit hydrograph? Why is base flow separated from the flood hydrograph in the processes of developing a unit hydrograph?

(d) A line 2.7 km long was measured in catenary with a tape of 90.0 m which was standardised under no pull at 30°C. The tape in use was $\frac{1}{7}$ cm wide and $\frac{1}{20}$ cm thick. The line is measured at a temperature of 45°C and with a pull of 5 kg. Find the correction on length, given that

(i) α (Coefficient of expansion) = $11.4 \times 10^{-6}/°C$

(ii) Wt. of one cubic cm of tape material = 7.7 gms

(iii) Modulus of elasticity of tape material = 2.1×10^6 kg/cm^2 10+10+6+10

7. (a) The gross commanded area for an irrigation canal is 15,000 hectares out of which 80 per cent is cultural commanded area. The irrigation is 50 per cent for rabi. If the core period is 4 weeks for rabi, then determine the (i) outlet discharge. The outlet factor for rabi may be assumed as 1800 hectares/cumes, (ii) also calculate the delta for rabi.

(b) Given the following 2-hr unit hydrograph for a drainage basin, determine the hourly ordinates of the 4-hr unit hydrograph given that—

Time (hr)	0	1	2	3	4	5	6
Q (m^3/s)	0	20	60	80	50	20	0

(c) Discuss the advantage of plane table survey with chain survey. Discuss three point problem in plane table survey.

(d) Write down the construction steps for water bound macadam road. 10+8+12+6

8. (a) The area of the plan of an old survey plotted to a scale of 10 metres to 1 cm measures now as 90.5 sq.cm as found by a planimeter. The plan is found to have a shunk so that a line originally 10 cm long now measures 9.5 cm only. These was also a note on the plane that 20 m chain used was 9 cm too short. Find the true area of the survey.

(b) Design a circular settling tank unit for the secondary treatment of sewage @13.5 million litres per day. The detention period is to be about 2 hours, and the surface loading 40,000 litres per sq.m of the tank area per day.

(c) Calculate the deflection at the surface of a pavement due to a wheel load of 40 kW and a tyre pressure of 0.5 MN/m^2. The value of Young's modulus (E) and subgrade may be assumed to be uniformly equal to 20 MN/m^2.

(d) Discuss confined aquifer and unconfined aquifer with neat sketches. 10+10+10+6

9. (a) A 30 cm diameter well completely penetrates a confined aquifer of permeability 45 m/day. The length of the strainer is 20 m under steady state of pumping the draw down at the well was found to be 3.0 m and the radius of influence was 300.0 m. Calculate the discharge.

(b) Design a dowel bar system for cement concrete slab for the following conditions:

(i) Design wheel load = 4100 kg

(ii) Design load transfer = 40%

(iii) Slab thickness h = 20 cm

(iv) Joint width z = 2.0 cm

(v) Permissible flexural stress in dowel bar = 1400 kg/cm^2

(vi) Permissible shear stress in dowel bar = 1000 kg/cm^2

(vii) Permissible bearing stress in concrete = 100 kg/cm^2

(viii) 'K' value of subgrade 8 kg/cm^2, K is the subgrade reaction

(ix) $E = 3 \times 10^5$ kg/cm^2 Young's modulus

(x) $\mu = 0.15$ Poisson's ratio. Assumed any other value as per IRC

(c) Discuss the factors which is responsible for air pollutions. What do you mean by primary and secondary pollutants in air? How do you find the pollutants in air? 10+16+10

2023

COMMERCE AND ACCOUNTANCY

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one language.*

Answer any five (5) *questions taking at least* one (1) *from each group.*

Group-A

1. The directors of B Ltd. ask you to prepare the Statement of Profit & Loss for the year ended 31st March, 2022 and Balance Sheet as on that date from the following information:

Dr. ***Cr.***

Particulars	₹	***Particulars***	₹
Plant at cost	3,00,000	Equity Share Capital	
Land & Building at cost	5,00,000	(in shares of ₹ 100 each)	5,00,000
Investment in Shares	2,00,000	16% Preference Share Capital	
Stock	70,000	(in shares of ₹ 100 each)	1,00,000
Cash at Bank	60,000	Depreciation up to 31.03.2021	
Debtors	50,000	on Plant 1,00,000	
Income Tax deducted at		on Land & Building 1,50,000	2,50,000
source on dividend	2,200	General Reserve	10,000
Establishment Expenses	15,000	Profit & Loss Account on 1.04.2021	25,000
Rent and Taxes	6,000	Creditors	30,000
Audit Fees (including ₹ 1000		Dividend (Gross)	10,000
paid for other services)	2,500	Miscellaneous Receipts	2,300
Managing Director's		Trading Account Balance	3,04,400
Minimum Remuneration	12,000		
Directors' fees	2,000		
Sundry Expenses	6,000		
Income Tax for the previous			
year not provided for	6,000		
	12,31,700		12,31,700

Additional Information:

(a) Depreciation to be charged on the written down value on Plant @ 10% and Land & Building @ 5%.

(b) The Directors propose to recommend a divided of 12% on equity share.

(c) Provision for Taxation is to be made @ 40%.

(d) The Managing Director is entitled to 5% of the net profit subject to a minimum of ₹ 12,000 per annum as his remuneration.

(e) A sum of ₹ 15,000 is to be transferred to General Reserve. 40

Or,

Write Notes on: 8×5

(a) Convention of Conservatism

(b) Convention of Disclosure

(c) Cash Flow Statement

(d) Bank Reconciliation Statement

(e) Accounting treatment of redemption of preference shares

2. The following is the Balance Sheet of Y Ltd. as at 31st March, 2022:

Particulars	*Note No.*	*Amount (₹)*
I. EQUITY AND LIABILITY:		
1. Shareholders' Funds:		
(a) Share Capital	1	12,00,000
(b) Surplus	2	(3,60,000)
2. Non-Current Liabilities:		
(a) Long-term Borrowings (6% Debentures)		2,00,000
3. Current Liabilities:	3	
(a) Short-term Borrowings (Bank Overdraft)		1,00,000
(b) Trade Payables (Creditors)		40,000
(c) Other Current Liabilities (Interest due on Debentures)		60,000
Total		**12,40,000**
II. ASSETS:		
1. Non-Current Assets:		
(a) Property, Plant and Equipment—		
(i) Tangible Assets		8,00,000
(b) Non-Current Investment (investment)		1,00,000
2. Current Assets:		
(a) Inventories (Stock)		2,40,000
(b) Trade Receivables (Debtors)		80,000
(c) Cash and Equivalents (Cash)		20,000
Total		**12,40,000**

Notes to Accounts:

Particulars	*Amount (₹)*
1. Share Capital:	
(i) Subscribed Capital:	
(a) Subscribed and fully paid up	
80,000 Equity Shares of ₹ 10 each	8,00,000
4,000 8% Preference Shares of ₹ 100 each	4,00,000
	12,00,000
2. Surplus:	
Statement of Profit & Loss (Debit)	(4,40,000)
Less: Profit for the year	80,000
	(3,60,000)
3. Property, Plant and Equipment— Tangible Assets:	
(i) Land & Building	6,00,000
(ii) Plant & Machinery	2,0,000
	8,00,000

The preference dividends are in arrear for three years. Considering the improvement made in the working of the company, the directors decide upon a scheme of reconstruction with a reduction of capital and it is approved of the following terms:

(a) The Preference Shareholders agree that their shares be reduced to a fully paid share of ₹ 90 each. They will accept Equity Shares of ₹ 4 each fully paid for half of their arrear dividends and the rest half will be forgone.

(b) The Equity Shareholders agree that their shares be reduced to fully paid shares of ₹ 4 each further subscribe 40,000 Equity Shares of ₹ 4 each fully paid for working capital purposes.

(c) The debenture holders have agreed to accept fully paid Equity Shares for the interest due to them.

(d) Investments are to be sold for ₹ 90,000 and money thus available along with new issues be utilized to pay off Bank Overdraft.

Show the necessary Journal Entries to record the scheme of capital reduction and draw up a new Balance Sheet after the scheme taking into account:

(i) Plant & Machinery be depreciated by 10%;

(ii) Obsolete Stock of ₹ 30,000 be written off. 40

Or,

Write notes on: 8×5

(a) Minority Interest

(b) Consolidated Balance Sheet

(c) Purchase Consideration

(d) Issue of Bonus Shares

(e) Forfeiture of Shares

3. (a) The following balances appeared in the books of S Ltd. on 1.04.2022:

(i) Sinking Fund Account ₹ 50,000

(ii) Sinking Fund Investment Account (10% Govt. Securities, Nominal Value ₹ 45,000) ₹ 48,000

(iii) 12% Debentures ₹ 1,00,000

The company sold ₹ 30,000 Govt. Securities at 110% and utilized the amount to redeem part of debenture at a premium of 10%.

Show Debenture Account, Sinking Fund Account and Sinking Fund Investment Account in the books of the company.

(b) From the figures given below prepare a statement showing the sources and application of funds during the year 2021-2022:

Assets	*31.03.2021*	*31.03.2022*	*Liabilities*	*31.03.2021*	*31.03.2022*
Fixed Assets (Net)	5,10,000	6,20,000	Share Capital (Equity)	3,00,000	3,50,000
Investment	30,000	80,000	Share Capital (Preference)	2,00,000	1,00,000
Current Assets	2,40,000	3,75,000	Debentures	1,00,000	2,00,000
Discount on Debentures	10,000	5,000	Reserves	1,10,000	2,70,000
			Provision for Doubtful Debts	10,000	15,000
			Current Liabilities	70,000	1,45,000
	7,90,000	10,80,000		7,90,000	10,80,000

You are informed that during the year:

(i) A machine costing ₹ 70,000 (book value ₹ 40,000) was disposed off for ₹ 25,000.

(ii) Preference Share redemption was carried out at a premium of 5%.

(iii) Dividend at 15% was paid on equity share for the year 2007-2008.

(iv) The provision for depreciation stood at ₹ 1,50,000 on 31.03.2021 and at ₹ 1,90,000 on 31.03.2022.

(v) Stock which was valued at ₹ 90,000 as on 31.03.2008 was written up to its cost ₹ 1,00,000 for preparing the Profit & Loss Account for 2021-2022. 20+20

Group-B

4. (a) From the following data relating to production of one unit of Product-A for December, 2021 of a factory, calculate all the Material Variances.

Name of Materials	**Standard**		**Actual**	
	Kg.	**Rate (₹)**	**Kg.**	**Rate (₹)**
X	8,000	1·05	7,500	1·20
Y	3,000	2·15	3,300	2·30
Z	2,000	3·30	2,400	3·50

(b) Draw the relationship between Standard Costing and Budgetary Control. 20+20

5. (a) A purchase manager places order, each time for a lot of 500 numbers of a particular item. Following information is available:

Inventory Carrying Cost	40%
Ordering Cost per order	₹ 600
Cost per unit	₹ 50
Annual Demand	1,000

Find out the loss to the organisation due to his ordering policy.

(b) A machine was purchased on January 1, 2021 for ₹ 5 lakhs. The total cost of all machinery inclusive of the new machine was ₹ 75 lakhs.

The following further information is available:

(i) Expected life of the machine 10 years

(ii) Scrap value at the end of 10 years life ₹ 5,000

(iii) Repair and Maintenance for the machine during the year ₹ 2,000

(iv) Expected number of working hours of the machine per year 4,000 hours

(v) Insurance premium annually for all machines ₹ 4,500

(vi) Electricity consumption for the machine per hour (@₹ 0·75 per unit) 25 units

(vii) Area occupied by the machine 100 sq. ft.

(viii) Area occupied by other machines 1,500 sq. ft.

(ix) Rent per month of the department ₹ 800

(x) Lighting charges for 20 points for the whole department, out of which 3 points are for the machine ₹ 120 per month.

Compute the machine hour rate for the new machine on the basis of the data given above.

20+20

6. (a) The sales and profits during two years were as given below:

Year	**Sales (₹)**	**Profit (₹)**
2021	1,50,000	20,000
2022	1,70,000	25,000

You are required to compute:

(i) P/V Ratio

(ii) Break-Even Point

(iii) Sales required to reach a profit of ₹ 40,000

(iv) Profit made when sales are ₹ 2,50,000

(v) Margin of safety at a profit of ₹ 50,000

(vi) Variable costs of the two periods.

(b) Explain in details the *treatment of under and over absorption* in cost accounting with suitable example. 20+20

Group-C

7. (a) In a Value Added Tax (VAT) system, Mr. X is a registered dealer. He deals in purchasing and selling goods within the State of West Bengal. During the month of April, 2016 his sales are as follows:

Particulars	**Sales price (inclusive of VAT wherever applicable–charged separately)** ₹
1. Sale of Schedule A goods (Exempted goods)	72,500
2. Sale of Schedule C goods (VAT rate 4%)	2,36,800
3. Sale of Schedule CA goods (VAT rate 13·5%)	5,90,200

Other particulars:

(i) Sales return on April 24, 2016 of Schedule C goods within 6 months of sale ₹ 37,440 (inclusive of VAT)

(ii) Sale of Schedule C goods include ₹ 60,000 which have been purchased on paying tax on MRP

(iii) Delivery charges included in the above sales ₹ 5,600, ₹ 15,200 and ₹ 22,500 respectively

(iv) Rebate allowed on sale of Schedule CA goods ₹ 5,800 (adjusted in the sales figure as given in point 3 above)

Calculate:

(I) Sale Price

(II) Turnover of sales

(III) Taxable turnover of sales

(IV) Output tax payable

(b) Define 'Input Tax' and 'Input Tax Credit' as per West Bengal VAT Act. 20+20

8. (a) Mr. B submits the following particulars of his incomes and losses for the year 2020-2021:

Particulars	*Amount (₹)*
Income from Salaries	3,15,000
Income from House Properties:	
Income from let out house	1,25,000
Loss from self-occupied house	1,50,000
Income from Business:	
Income from Business A	1,05,000
Loss from Business B	1,98,500
Income from speculative business	32,200
Long-term capital gains on sale of building	46,358
Long-term capital gains on sale of land	62,521
Short-term capital gain on sale of shares	15,230
Lottery income	42,500
Loss from horse race	12,300

Compute total income of the assesse.

(b) "Incidence of tax depends on the residential status of an assesse."— Discuss with reference to the relevant provisions of the Income Tax Act. 20+20

9. (a) Discuss in details the basic and additional conditions in relation to residential status of an individual under the Income Tax Act with suitable examples.

(b) Write a detailed note on classification of costs in Cost and Management Accounting. 20+20

2023

COMMERCE AND ACCOUNTANCY

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one language.*

Group-A

Answer Question No. 1 *and* any one *from the rest.*

1. (a) Give a brief overview of the components of the Indian Financial Markets.
   (b) 'Financial System co-ordinates between savings and investments.'— Comment.
   (c) What is globalization of financial markets? 16+16+8

2. (a) Distinguish between money market and capital market.
   (b) Explain in brief the monetary policy adopted by the Reserve Bank of India. 16+16

3. (a) Distinguish between primary market and secondary market.
   (b) Explain in brief the functioning of capital market in India. 16+16

4. (a) Explain in brief the qualitative credit control of Reserve Bank of India.
   (b) Describe the functioning of call money market in India. 16+16

Group-B

Answer any two *questions.*

5. (a) Define 'Offer'.
   (b) What are the essentials of a valid offer and valid acceptance?
   (c) Discuss the remedies of breach of contract. 4+16+12

6. (a) Discuss, in brief, the jurisdiction and composition of State Commission under the Consumer Protection Act.
   (b) Discuss the composition and objectives of Central Consumer Protection Council. 16+16

7. (a) Discuss in brief the matters to be stated in the Prospectus of a Company.
   (b) Point out the differences between a Public Company and a Private Company.
   (c) State how can a Private Company be converted into a Public Company. 6+16+10

8. (a) What are the objectives of Industrial Dispute Act?

   (b) Describe the power and duties of dispute settlement authorities under Industrial Dispute Act. 16+16

Group-C

Answer any one *question.*

9. (a) Distinguish between Internal Check and Internal Control.

   (b) What is Internal Audit?

   (c) What are the objectives of Internal Audit? 16+4+12

10. Write short notes on: 8+8+8+8

   (a) Qualified Audit Report

   (b) Audit of a NGO

   (c) Audit of a Bank

   (d) Audit of an Insurance Company

Group-D

Answer any one *question.*

11. (a) Distinguish between Line and Staff Organisations.

   (b) Write a brief note on 'Leadership Style'. 16+16

12. (a) Explain in brief Maslow's 'Hierarchy of Needs Theory'.

   (b) 'Money may not be the sole motivating factor'. — Comment. 16+16

2023

ZOOLOGY

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English** *or in* **Bengali** *but all answers must be in one and same language.*

Group-A

1. Answer *any ten* questions: 4×10=40

   (a) Evaluate the strength and weakness of evolutionary species concept.

   (b) Distinguish between proteroglyphous and solenoglyphous poison fangs.

   (c) Comment on the significance of baleen in whale.

   (d) State the location and function of Cnidoblast.

   (e) Comment on 'umbrella species'. Give example.

   (f) "Two species cannot co-exist if they occupy the same niche"—Explain.

   (g) Classify Phylum Cnidaria up to subclass.

   (h) State the structural and functional significance of sclerosepta.

   (i) Define the 'Law of Priority' with example.

   (j) Comment on Minamata disease.

   (k) How does double respiration occur in the lungs of a pigeon?

   (l) State the information that must be documented while describing a holotype.

Group-B

Answer *any four* questions. 20×4=80

2. Compare the following: 5×4=20

   (a) Gill structure of Chondrichthyes and Osteichthyes

   (b) Mesonephric and Metanephric kidney

   (c) Physostomous and Physoclistous swim bladder in fish

   (d) Neoteny and Paedogenesis

3. (a) What is coral?

   (b) Mention the types of coral reef along with their distribution.

   (c) State the physical parameters required for coral reef formation.

   (d) Comment on the different kind of threats to coral reef.

   (e) State the significance of coral reef in maintenance of ecological balance. 2+5+4+6+3=20

4. (a) Give an account of the nuclear changes during conjugation in *Paramoecium* sp.

   (b) Discuss the modification of aortic arches in the teleost, amphibia and aves.

   (c) Comment on the functional significance of aortic arch. 6+(4+4+4)+2=20

5. (a) State the significance of the foramen of ovale.

   (b) Discuss the principles flight in birds.

   (c) Discuss the impact of torsion on the nervous system in gastropods.

   (d) Mention two reptilian and two mammalian features of the monotremes. 4+6+6+4=20

6. (a) Explain with example how radial symmetry differs from bilateral symmetry.

   (b) State the adaptive significance of body symmetry.

   (c) Give an illustrated account of amoeboid movement.

   (d) Briefly describe the functionality of a ruminant stomach. 4+4+7+5=20

7. Write short notes on: 5×4=20

   (a) Green gland

   (b) Book lung

   (c) Social organisation in termites

   (d) Significance of the organ of Bojanus in molluss.

8. Comment on: 5×4=20

   (a) Evolutionary position of sphenodon

   (b) Mechanism of ecolocation in bats

   (c) Accessary respiratory structure in *Clarius* sp.

   (d) Types of poison in snakes

Group-C

Answer *any four* questions. 20×4=80

9. (a) What is biological species?

   (b) Mention the merits and demerits of biological species concept.

   (c) Comment on the role of pre-mating isolation on speciation.

   (d) What is ring species? Give example. 2+(4+4)+7+3=20

10. (a) What do you understand by megadiversity countries and biodiversity hotspots?

    (b) Name two biodiversity hotspots in India.

    (c) State the difference between lectotype and neotype.

    (d) Distinguish between the concept of hypervolume and realized niche. 6+2+(4+4)+4=20

11. (a) What is ecological pyramid?

    (b) When does an ecological pyramid get inverted?

    (c) Elucidate the different phases of S-shaped population growth form citing an animal population model.

    (d) "Energy flow in an ecosystem maintains the second law of thermodynamics"— Explain.

    (e) "The more the stratification in a community, the more the species richness"— Explain. 2+3+5+5+5=20

12. (a) Comment on photochemical smog and mention its impact on human health.

    (b) Mention the salient recommendations of the Kyoto Protocol.

    (c) State the cause of ocean acidification.

    (d) Explain altruism and reciprocal altruism.

    (e) State Hamilton's rule on the coefficient of relatedness (r). 4+4+5+4+3=20

13. Write short notes on: 5×4=20

    (a) Application of Chi-square

    (b) Man–animal conflict with reference to elephant

    (c) Project tiger

    (d) Greenhouse effect

14. Compare the following: 5×4=20

(a) Autotrophic and Heterotrophic successions

(b) National park and Biosphere reserve

(c) Sympatric species and Allopatric species

(d) *In-situ* and *ex-situ* conservation

2023

ZOOLOGY

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

1. Answer *any ten* questions: 4×10=40

   (a) What is DNA methylation?

   (b) Comment on the pancreatic endocrine secretions and functions.

   (c) Mention the factors that can destabilize the Hardy-Weinberg Equilibrium of a population.

   (d) State the points of difference between B-DNA and Z-DNA.

   (e) Comment on the basic structure of nucleosome with proper illustration.

   (f) State the role of co-enzyme in an enzyme action.

   (g) State the significance of abundance of cysteine and proline in the hinge region of an immunoglobulin molecule.

   (h) Compare the R-form and T-form of haemoglobulin.

   (i) State two examples of passive immunization mentioning the types of immunoglobulin involved.

   (j) How are the single stranded regions of DNA at the ends of human chromosomes remain protected from degradation by nucleases and other enzymes?

   (k) Explain the theory of endosymbiosis with respect to the origin of life.

   (l) How does foetal haemoglobin differ from adult haemoglobin?

   (m) State the techniques involved with the process of subcloning in case of plasmid vectors in *E. coli*.

   (n) Explain the terms relapse and recrudescence with reference to the occurance of malaria.

   (o) Compare precipitin and agglutinin with reference to antigen-antibody interaction.

Group-B

Answer *any four* questions. 20×4=80

2. (a) Describe the pentose phosphate pathway in relation with glucose metabolism citing proper flow-chart.

   (b) How does oxidative phosphorylation occur in the mitochondria? 15+5

3. (a) Establish the fluidic nature of plasmamembrane citing experimental proof.

   (b) Comment on the asymmetric distribution of phospholipids in plasmamembrane.

   (c) Explain the operational principle of voltage gated sodium channel during nerve impulse propagation. 5+5+10

4. (a) Illustrate the Enzyme Commission's scheme for the classification of enzymes with examples.

   (b) How can you express the different types of reversible enzyme inhibition?

   (c) Describe briefly the molecular structure of t-RNA with proper illustration. 6+8+6

5. (a) Compare the objectives and working principles of indirect and sandwich enzyme linked immunosorbent assay (ELISA) with suitable illustrations.

   (b) Comment on the significance of Bombay Phenotype in a patient.

   (c) A woman has two dominant traits: cataract, which she inherited from her father and polydactyly, which she inherited from her mother. Her husband has neither of the mentioned traits. If the gene for these two traits are 20 cM (centimorgan) units apart on the same chromosome, what is the chance that the first child of this couple will have both cataract and polydactyly? 10+5+5

6. (a) How does hormone regulate G-protein coupled receptors?

   (b) How does aldosterone maintain homeostasis?

   (c) What are 'atretic follicles'?

   (d) What are the primary functions of estrogen? 10+5+3+2

7. (a) How can you elucidate the "one gene one polypeptide" concept with respect to the occurance of sickle cell anaemia?

   (b) Explain the phenomenon of transport of oxygen by haemoglobin from lungs to tissue. 10+10

8. Write short notes on: 5×4=20

   (a) Polymerase Chain Reaction (PCR)

   (b) Ultrastructure of mitochondria

   (c) Turner syndrome

   (d) Thalassemia

Group-C

Answer *any four* questions. 20×4=80

9. (a) How can you determine the age of a fossil?

   (b) Why is it inappropriate to rely on radiocarbon dating while determining the age of a fossil which is million years old?

   (c) What is index fossil? Give example.

   (d) Describe the event of biogeny with relation to the theory of origin of life. 5+3+2+10

10. (a) Describe the ultrastructure of the promastigote of *Leishmania* sp.

    (b) What is T-cell anergy?

    (c) Describe the life cycle of *Ancylostoma* sp. with illustration.

    (d) Why is gametogenesis restricted within the secondary host in the life-history of *Plasmodium* sp.? 5+4+6+5

11. (a) State the disadvantages of using chemical pesticides to control pests.

    (b) Enumerate the role of exotic carps in the polyculture of fish.

    (c) Provide an account of the equipment necessary for mulberry silkworm rearing.

    (d) Why cannot membrane attack complex induce innocent bystander lysis to healthy cells? 5+3+7+5

12. (a) Give an account of the structural and physiological adaptations found in desert animals.

    (b) Why are camels best suited for desert life?

    (c) Explain aggressive mimicry with proper example. 10+5+5

13. (a) "The secondary humoral immune response is more intense than the primary response against same antigen"— Explain.

    (b) Describe the events of development of heart in chick.

    (c) Mention the forces involved in the formation of the antigen-antibody complex.

    (d) Describe the process of spermiogenesis in human/rodent. 5+7+3+5

14. Write short notes on: 5×4=20

    (a) Immunoglobulin G

    (b) Vertebrate fauna in Oriental realm

    (c) Pathophysiology of tuberculosis

    (d) Problems of 'deep litter' system in poultry keeping

2023

BOTANY

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** or in **Nepali** but all answers must be in one and same language.*

Group-A

Answer *any four* of the following.

1. Write brief notes on *any four* of the following: 10×4=40
   (a) Ecological importance of Lichen
   (b) Description of Williamsonia
   (c) Application of forensic palynology
   (d) Autocology and synecology
   (e) Pathotoxins and phytovivotoxins
   (f) Age and area hypothesis of endemism

2. Explain *any four* of the following: 10×4=40
   (a) Adaptive anatomical features of xerophytes
   (b) Tunica-Corpus theory of shoot apex
   (c) Placentation types in angiosperm
   (d) Parasexuality in fungi Deuteromycetes
   (e) Major characteristic features of Rhodophyceae
   (f) Phytoremediation

3. Distinguish between *any four* of the following: 10×4=40
   (a) Biotrophic and necrotrophic plant pathogens
   (b) Trace fossils and index fossils
   (c) Diagnostic features of Orchidaceae and Zingiberaceae
   (d) Actinobacteria and eubacteria
   (e) True fruit and false fruit with examples
   (f) Melisopalynology and aeropalynology

4. Discuss *any four* of the following: 10×4=40

   (a) Criteria for designation of Biosphere reserve zones and Gyopreservation and Oxygen sink

   (b) Characteristics of Medullosales

   (c) Role of botanical gardens in conservation of plants

   (d) Endemism in Indian flora with reference to Sundarban

   (e) Post-fertilization changes in ovule and development of endosperm in angiospermic flower.

   (f) Distribution of mechanical tissues in plants

5. Write and illustrate *any four* of the following: 10×4=40

   (a) Stellar types found in plant

   (b) Food value of mushroom and ecomic development

   (c) Secondary growth of the stem *Dracaena* and root of *Tinospora*

   (d) Origin of seed habit in Pteridophyta

   (e) Draw and write up on disease cycle of brown spot of rice. Ecological importance of forest

   (f) Phytogeographical regions of India

Group-B

Answer *any two* questions.

6. (a) State basic characters of Heterokontophyta. Comment on the thallus organisation of this group. Write on principles of microalgae culture. 4+3+3=10

   (b) Give a brief outline of cheese production. Discuss heterothallism in fungi. 5+5=10

7. (a) Name economically important plants and their uses (*any two* from each) of family Orchidaceae and Solanaceae. Write down the chemical structure of sporoderm. Illustrate the structure of spore aperature types. 4+2+4=10

   (b) Enumerate the major categories of plasmids found in bacterial cell. Why do bacterial cells carry plasmids? What are the biological significance of plasmids? 4+2+4=10

8. (a) Discuss the role of Bryophyta in ecology with special reference to plant succession. Write down the seral stages with reference to Hydrosere. 5+5=10

   (b) Illustrate the structure of male and female reproductive parts of *Cycas*. 5+5=10

2023

BOTANY

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** or in **Nepali** but all answers must be in one and same language.*

Answer *any five* of the following. 40×5=200

1. Answer *any four* of the following:

   (a) Answer briefly:
   (i) Water potential
   (ii) RNA silencing
   (iii) ABC model of flower development 3+3+4=10

   (b) Distinguish between:
   (i) Homeotic gene and Gatekeeper gene
   (ii) Co-enzymes and Isoenzymes
   (iii) Translocation and Crossing over 3+4+3=10

   (c) Describe in brief:
   (i) Jasmonate hormone and Salicylic acid signaling
   (ii) Capping and polyadenylation of eukaryotic mRNA
   (iii) Regeneration of Ribulose diphosphate 3+4+3=10

   (d) Justify the following:
   (i) 12 : 3 : 1 ratio is a non-mendelian inheritance involving non-allelic interaction.
   (ii) Biopolymers are produced by cells of living organisms.
   (iii) Positive control of lac-operon is an additional regulatory mechanism. 4+3+3=10

   (e) Explain with diagram:
   (i) Pericentric inversion and paracentric inversion and meiotic metaphase configuration.
   (ii) Pathway of biosynthesis of chlorophyll.
   (iii) Role of MPF in cell cycle regulation. 4+2+4=10

2. Answer *any four* of the following: 10×4=40

   (a) (i) Explain Northern blotting and Southern blotting.
   (ii) Explain one gene — one polypeptide concept 6+4=10

   (b) (i) Define point mutation. Explain the induced mutation by – 5-Bromouracil, Proflavin, UV rays.
   (ii) Write a brief note on overlapping gene. 8+2=10

(c) (i) Name different DNA markers and use of DNA markers in improvement of plant quality.
(ii) Concept on tautomerisation and dimerisation. 7+3=10

(d) (i) Write notes on principles of enzyme action and enzyme kinetics.
(ii) Basic concept of nif and nod gene and role of them in biological nitrogen fixation. 4+6=10

(e) (i) Explain in brief causes of Heterosis and hybrid seed production.
(ii) Justify the statement that inversions suppress crossovers, coupling and repulsion hypothesis both are present in linkage phenomenon. 5+5=10

3. Answer *any four* of the following:

(a) (i) What is linkage group? Are pseudogenes occur as defective copies of functional genes?
(ii) Enzymes involved and their functions in prokaryotic DNA replication. 4+6=10

(b) (i) Briefly write a note on Fidelity of DNA replication.
(ii) Role of ethylene and abscisic acid in plant growth and development. 4+6=10

(c) (i) Write down the role of auxin on seed germination and dormancy.
(ii) Role of cytokinin and gibberellin acid (GA). 5+5=10

(d) (i) Explain the statement that eukaryotic DNA has multiple origin of DNA replication.
(ii) Write down the origin of okazaki fragments. What are leading strand and lagging strands of DNA during replication? 5+5=10

(e) Answer the following in brief:
(i) Are humans influencing the process of evolution?
(ii) The four factors at work in evolution.
(iii) How the genetic causes are involved in evolution? 2+4+4=10

4. Answer *any four* of the following:

(a) Describe in brief with figure:
(i) Oxidative phosphorylation and glucose phosphorylation. Does ATP phosphorylate glucose?
(ii) Nuclear envelope and nuclear pore complex. 5+5=10

(b) Write notes on:
(i) Agrobacterium mediated gene transfer.
(ii) Plant's response to stresses-biotic and abiotic. 5+5=10

(c) Write down about:
(i) Steps of Kreb's cycle with illustration.
(ii) Principles, steps and applications of PCR; What is RT-PCR? Role of RT-PCR in COVID-19 virus detection. 5+5=10

(d) Write down on:
(i) Illustrate molecular mechanism of crossing over – Holliday model.
(ii) Water potential and properties of water chemistry in plant.
(iii) Michaelis constant. 5+3+2=10

(e) (i) Describe with evidence that the genetic code is degenerate and Wobble hypothesis.
(ii) Function of magnesium and its deficiency symptoms in plants. 5+5=10

5. Answer *any four* of the following:

(a) Write down about:
(i) The organoleptic and chemical evaluation of drugs.
(ii) The scientific name, family and constituents of ginger and sarpagandha. 5+5=10

(b) Distinguish between:
(i) Co-enzyme and Holoenzyme
(ii) Embolism and Cavitation.
(iii) Glycosides and Disaccharides. 3+4+3=10

(c) Write down on:
(i) Drug adulteration and alkaloids with examples (at least one)
(ii) Discuss the role of calcium – channel of plant in signal transduction
(iii) Difference between C_3 and C_4 plants 3+4+3=10

(d) Brief concept on:
(i) DNA repair through photoreactivation
(ii) Amphidiploidy and evolution of wheat 5+5=10

(e) Write down brief note on – with figure:
(i) Formation of metaphase chromosome on the basis of nucleosomes model
(ii) Steps of micropropagation in tissue culture 5+5=10

6. Answer *any four* of the following:

(a) (i) Hardy – Weinberg principle and factors affecting it.
(ii) In a population of 100 persons tested for their MN blood types, the genotypic data found were MM = 66, MN = 20 and NN = 14. Prove that the population was in Hardy Weinberg's equilibrium.
(iii) How do you calculate allele and genotype frequency using Hardy Weinberg? 4+3+3=10

(b) (i) Briefly explain allosteric inhibion of an enzyme and what happens through it. – Give an example.
(ii) Explain the three main stages of Calvin cycle. 4+6=10

(c) (i) Define dispersion, measures of dispersion.
(ii) Define with formula Standard Deviation.
Length of 55 seedlings of a species in cm were as follows:

Length of Plants	6-10	11-15	16-20	21-25	26-30
Number of Plants	5	10	11	9	20

Calculate standard deviation and standard error of frequency distribution.
(iii) What is the frequency of heterozygotes A_a in a randomly mating population in which the frequency of all dominant phenotypes is 0·19? 3+1+4+2=10

(d) Answer the following:

(i) What is the function of RecA protein? Why are the polyploids frequently sterile?

(ii) The following three recessive genes are found in plants:

pl-purple leaf, gl-glossy seedlings and t-dwarf variety. A trihybrid was test-crossed and the following proportions were obtained when a sample of 1000 plants were counted-wild type (+ + +) : 475, pl gl t (469); pl + + (8); + gl t (7); pl + t (18); + gl + (23), + + t (0); pl gl + (0). Determine the relative order and map distance. Is there any cross over interference? Justify your answer. 3+7=10

(e) (i) What is the difference between CAM idling and CAM cycling? Discuss the role of Calcium-Calmodulin in signal transduction.

(ii) Write short note on drug adulteration. 6+4=10

7. Answer *any four* of the following:

(a) (i) What are the products of light reaction of photosynthesis? How reduction of NADP is carried out?

(ii) Write note on photolysis and photorespiration. 2+3+5=10

(b) (i) Distinguish between light reaction and dark reaction.

(ii) Explain Richmond and Lang effect. 5+5=10

(c) (i) Explain production of Shikimic acid.

(ii) Role of Brassinosteroid in cell expansion and cell division in shoots of plants. 5+5=10

(d) (i) Explain protein sequencing.

(ii) What is miRNA and guide RNA? Role of guide RNA and CRISPR guide. 4+6=10

(e) (i) Explain the rules of probability.

(ii) Briefly explain – aminoacylation of tRNA, initiation of translation in prokaryotes with reference of roles of ribosomes and factors involved in it. 4+6=10

2023

CHEMISTRY

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Attempt *any ten* questions *at least three* from each group.

Group-A

1. (a) The van der Waals constants of a gas are $a = 6.50$ atm lit^2 mole^{-2} and $b = 0.056$ lit mole^{-1}. Calculate the critical pressure and molar critical volume of the gas. 4

   (b) Starting from the van't Hoff reaction isotherm, show that the equilibrium for an exothermic reaction shifts to the right on lowering of temperature. 4

   (c) Define surface tension of a liquid. Write its unit in CGS and SI system. A spherical air bubble is created within a liquid of surface tension 72 dyne/cm. If the volume of the bubble is $\pi/6$ cm^3, calculate the excess pressure inside the bubble. 1+1+2

   (d) What are Miller indices? Show 001 and 111 faces of a cubic crystal as Miller indices. 2+2

   (e) Show that $(\partial U/\partial V)_T = 0$ for a gas obeying the equation of state $P(V - nb) = nRT$. (Assume the relevant Maxwell relation.) 4

2. (a) Write down the Maxwell's equation for molecular speed and explain the terms involved. Show graphically how the distribution curves vary at two different temperatures T_1 and T_2 ($T_2 > T_1$) for the same gas. Calculate the root mean square velocity of oxygen gas at 27°C. 2+3+3

   (b) What are axis of symmetry and centre of symmetry of a crystal? Calculate the number of atoms per unit cell in a face centred cubic lattice. 2+2+2

   (c) Draw the P-V and T-S diagram of an ideal gas undergoing a Carnot cycle. What do the enclosed areas of the diagram signify in the two cases? Justify your answer. 6

3. (a) Define viscosity coefficient of a liquid. Write its unit in CGS systems. Explain that viscosity of a liquid decreases with rise in temperature, but that of a gas increase with temperature. 2+2+4

   (b) What is laminar flow of a liquid? How can one characterize a liquid flow turbulent or laminar? 3+3

   (c) Elucidate the nature of Keesom, Debye and London interatomic forces. 6

4. (a) Prove $\frac{P_C V_C}{RT_C} = \frac{3}{8}$ for a van der Waals gas, where P_C, V_C, T_C are critical pressure, critical volume and critcal temperature of the gas respectively. 4

   (b) The element polonium (atomic weight = 210) crystallizes in the cubic system. Bragg's first order reflections using X-rays of wavelength 0.154 nm occur at sin θ values of 0.225, 0.316, 0.388 for reflection from (100), (110) and (111) type planes.

   (i) Show whether the unit cell is simple, face-centred or body-centred.

   (ii) Calculate the value of 'a', the side of the unit cell.

   (iii) Calculate the density of polonium. 5+2+3

   (c) 1.0 moles of an ideal gas $\left(\overline{C}_p = 2.5R\right)$ at 1.0 atm and 300 K undergoes a reversible change so that the volume is doubled. The enthalpy change is 2078.5 J mol^{-1} and the heat absorbed is 1675 J mol^{-1}. Calculate the final temperature, final pressure and the work done during the process. 6

5. (a) Two spherical drops of mercury of diameter 0.4 mm and 0.2 mm merge to form one large drop at 27°C. Calculate the change in surface free energy during the process. Will the value increase if the same process is conducted at 100°C? Give reasons. Surface tension of mercury at 27°C = 480 dyne cm^{-1}. 5

   (b) One mole of supercooled water at (–8°C) and 1 atm pressure turns into ice at (–8°C). Calculate the entropy change of the system, surroundings and the net entropy change. Heat capacity of water and ice, at 1 atm, may be taken as 75.42 JK^{-1} mol^{-1} and 37.20 JK^{-1} mol^{-1} respectively. ΔH(fusion) = 6008 J mol^{-1} at 273 K. 5

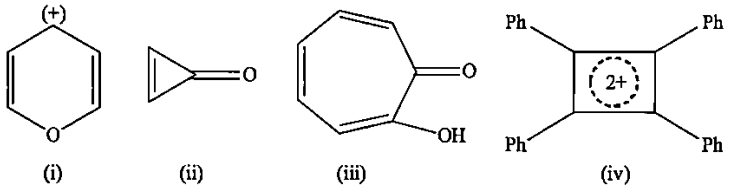
   (c) Define mean free path of gas molecules. Write down its mathematical expression. How does the mean free path of a gas change with rise in temperature at constant pressure? 2+2+2

   (d) What are the necessary conditions that are to be applied on van der Waals equation to obtain the expression for critical temperature (T_C), Boyle temperature (T_B) and the inversion temperature (T_i)? (No derivation required) 4

Group-B

6. (a) Dimethoxycarbene fails to react with isobutylene—Explain. 4

(b) Classify the following species as aromatic, antiaromatic or nonaromatic— Justify. 4



(i) (ii) (iii) (iv)

(c) Predict the product(s) of the following reaction. 4

$$Ph\,CH{=}CH{-}Co\,Ph \xrightarrow[2.\ H_3O^+]{1.\ Ph\,MgBr}$$

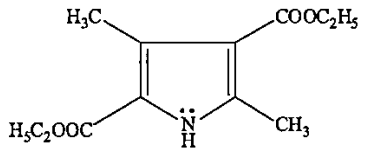
(d) Chlorofumaric acid undergoes dehydrochlorination at about 50 times faster than does chloromaleic acid to give the common product acetylene dicarboxylic acid. Explain this observation. 4

(e) How would you distinguish between the following compounds using ^{1}HNMR spectroscopy? 4

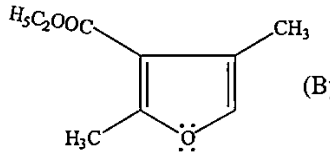
(i) $CH_3COOCH_2CH_3$ and $CH_3CH_2COOCH_3$

(ii) CH_3COCH_3 and CH_3CHO

7. (a) Predict the starting materials and synthesise the following compounds. 5+5

(i) 

(By Knorr synthesis)

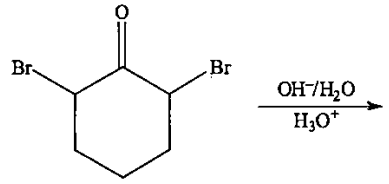
(ii) 

(By Feist Benary synthesis)

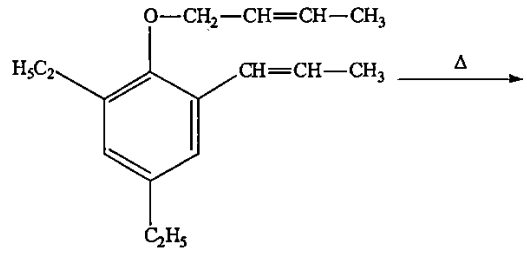
(b) Addition of HCl to 1-butene or 2-butene involves the same intermediate but the reaction of 1-butene is faster than that of 2-butene. Explain this observation with an energy profile diagram. 10

8. (a) Predict the product and suggest a plausible mechanism of the following reactions. 5+5

(i)



(ii)



(b) An organic compound (molecular mass 120) does not produce iodoform when treated with I_2/NaOH. It shows the following spectral characteristics:

UV : λ_{max} 292nm (ϵ_{max}16)

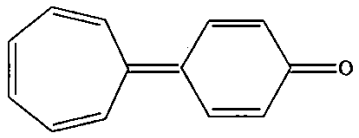
IR : 3,042 (m), 2,941 (w), 2,862 (w), 1,722 (s), 1605, 1575 (m), 1,462 (m) cm^{-1}

^{1}HNMR : δ7.27 (5H, m), 2.80 (2H, d), 9.78 (1H, t)

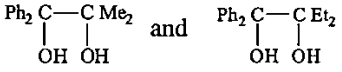
Determine the structural formula of the compound. 10

9. (a) Free rotation is possible about the double bond between the rings in the following compound. Explain.

(i)

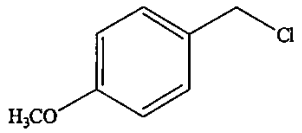


(ii) How would you prove by a cross-over experiment using the following two substrates that the pinacol-pinacolone rearrangement is intramolecular in nature? 5+5

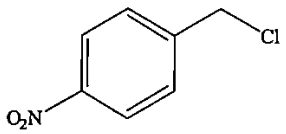


(b) (i) The azo compound dibenzyldiazene ($PhCH_2N{=}N\ CH_2Ph$) decomposes thermally to give N_2 at a rate faster than di-t-butyldiazene ($Me_3CN{=}CNMe_3$) does. Explain.

(ii) Which of the benzylic compounds will display SN^1 or SN^2 mechanism and why? 5+5



(I)

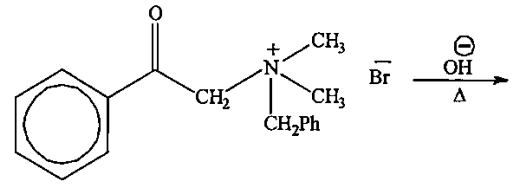


(II)

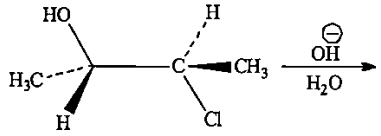
10. (a) The acetolysis of threo-3-phenyl-2-butyltosylate which is optically active gives a racemic product, while that of erythro diastereomer proceeds with retention of configuration to give optically active product— explain. 10

(b) Predict the product with a plausible mechanism (*any one*). 5

(i)



(ii)



(Optically active)

(c) Mesityl oxide (Me_2C=CHCoMe) shows two absorption bands one at 230 nm and another at 321 nm in isooctane. Assign these λ_{max} values in terms of electronic transitions. How do these absorption bands change their positions on changing the solvent from isooctane to water? 5

Group-C

11. (a) In an atom the angular momentum of an electron is $\sqrt{6}h/2\pi$. What will be the minimum value of the principal quantum number of the electron? 4

(b) Which of the following has greater melting point? RbCl and AgCl. 4

(c) The solubility of CaF_2 in water at 18°C is 2.04×10^{-4} mol/lit. Calculate solubility product. 4

(d) Find and explain the most stable dihalide among the followings: $SnCl_2$, $GeCl_2$, $PbCl_2$. 4

(e) Calculate Mulliken electronegativity of 'F' and 'Cl' from the given data: I.E. (Kcal mol^{-1}): F (401.7), Cl (299.1); E.A. (Kcal mol^{-1}): F (78.4), Cl (83.5). Convert the values to those of Pauling values using a suitable factor. 4

12. (a) The 3s and 3p orbitals have identical energies in the hydrogen atom, but in chlorine atom their energies are much different. Explain. 6

(b) Calculate the frequency of radiation emitted when an electron jumps from the third to first Bohr orbit. [Rydberg constant = 109677 cm^{-1}] 4

(c) Predict the structure of $XeOF_4$ indicating the hybridization of the central element. 4

(d) Comment the σ-donor and π-acceptor property of CN^- through MO approach. 6

13. (a) Although $N(CH_3)_3$ is a stronger base than NH_3, the adduct of the later is more stable than the former with $B(CH_3)_3$. Explain. 4

(b) $Fe(CN)_6^{3-} + e = Fe(CN)_6^{4-}$ $E^0 = 0.36$ V

$I_2 + 2e = 2I^-$ $E^0 = 0.54$ V

A solution of potassium ferricyanide cannot oxidise iodide to iodine but it can do so in presence of Zn^{2+}ion — Explain. 4

(c) What is comproportionation reaction? Give example. 4

(d) Compare the reducing ability of gaseous H_2S, H_2Se and H_2Te. 4

(e) Explain the following order of ionization energies (IE_1 in KJ/mole): $_{29}Cu$ (745), $_{30}Zn$ (906), $_{31}Ga$ (579). 4

14. (a) Arrive at Bohr's quantisation principle from de Broglie equation. 4

(b) "Though the (n + 1) rule to determine the order of energy of different subshells is useful in most cases, there are some exceptions" — justify the statement with an example. 4

(c) Point out the number of radial node for 3d orbital. 2

(d) Explain why Li_3N can be formed while Na_3N is not. 6

(e) Predict and justify the order of dipole moment of CH_3Cl and $CHCl_3$. 4

15. (a) Which one is more acidic in gas phase: PH_3 or NH_3? 4

(b) What are redox indicators? Give one example with structure both in oxidised and reduced states. 3+2

(c) Using Slater' rule determine Z^* for a 4s and a 3d electron of copper. Which type of electron is more likely to be lost when copper forms a positive ion? 3+3

(d) Justify the ionization energy values of the following elements. 5

Element	I_1 (eV)	I_2 (eV)
Ga	5.99	20.51
Ge	7.89	15.93
As	9.81	18.63

2023

CHEMISTRY

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

(Attempt *any ten* questions *at least three* from each group.)

Group-A

1. (a) In the phase diagram solid-liquid line slopes slightly to the right for carbon dioxide but that leans slightly to the left for water. Explain stating appropriate equation. 4

   (b) If a polymer sample contains an equal number of moles of species with degree of polymerization X = 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10. What are the number average and weight average degrees of polymerization? 4

   (c) The radioactive nuclide X has two decay modes (both first order): $X \rightarrow B$ and $X \rightarrow C$, with decay constant k_1 and k_2 respectively. Express $t_{½}$ of X in terms of k_1 and k_2. 4

   (d) A first order reaction is 75% complete in 32 minutes. Calculate its half-life ($t_{½}$). 4

   (e) State the essential requirement for a molecule to be microwave active. Obtain an expression for the line spacing in the microwave spectra of a diatomic rigid rotor. 4

2. (a) Draw the labelled phase diagram of H_2O system and describe it. At atmospheric pressure, iodine sublimes but sulphur melts. Explain. 2+3+2

   (b) Write down the BET equation of adsorption explaining the terms involved and hence state the principle of determination of the surface area of a finely divided solid. 5

   (c) State the basic principles of Transition State Theory. If the activation energy for the gaseous reaction $H_2 + I_2 \rightarrow 2HI$ is 167 kJ and the ΔH for the reaction is –8.2 kJ, what is the activation energy for the decomposition of HI? 4+4

3. (a) The quantum yield of CO in the photolysis of gaseous acetone ($P < 6$ kPa) at wavelengths between 250-320 nm is unity. After 20 min irradiation with light of 313 nm wavelength, 18.4 cm^3 of CO (measured at 1008 Pa and 22°C) is produced. Calculate the number of quanta absorbed and the absorbed intensity in joules per second. 4

(b) A polymer sample contain equal masses of particles with molecular weights 10,000 and 20,000. Calculate the number average $\left(\overline{M_n}\right)$ and the weight average $\left(\overline{M_w}\right)$ molecular weight of the polymer. How can you express the specific viscosity of a polymer solution (η_{sp}) in terms of η and η_0, where η represents the viscosity of polymer solution and η_0 represents the viscosity of pure solvent? 4+2

(c) The rotational constant B of $*C^{16}O$ molecule is $55.35 \times 10^9 s^{-1}$ and the equilibrium bond length is 1.128×10^{-10}m. Find the isotopic mass of *C atom. 5

(d) With the help of Jablonski diagram, show the various photophysical processes through which a molecule in excited singlet state (S_2^v) can return to the ground singlet state (S_0). [v indicates vibrational level, other terms have their usual significance] 5

4. (a) In any solution for which Raoult's law is applicable to the solvent, Henry's law must hold for the solute, over the same concentration range. — Explain. Four phases of sulphur cannot exist simultaneously at equilibrium. — Justify or Criticize. 4+2

(b) How can the molecular weight of macromolecules be determined by viscometry? 5

(c) The gas phase reaction $2A \rightarrow B + C$ is bimolecular with an activation energy of 24000 cal mol^{-1}. The molecular weight and diameter of A are, respectively 60 and 3.5 angstrom. After deducing the necessary equation using the Collision theory of reaction rate, calculate the value of rate constant at 300 K (Assuming steric factor = 1). 4

(d) What is the polydispersity index of a polymer sample containing 200 molecules each of molecular weight 10,000 g mol^{-1}, 300 molecules each of molecular weight 30,000 g mol^{-1} and 500 molecules each of molecular weight 50,000 g mol^{-1}? 5

5. (a) Do the wavelength of light used and the width of the cell have any influence on (i) optical density and (ii) molar extinction coefficient? Explain photosensitized reactions and give an example of photosensitized reaction which is useful to mankind. 5+3

(b) Write down the expression of temperature dependent Arrhenius equation on reaction rates, explaining the terms involved. How do you define 'energy of activation' for a chemical reaction? 2+2

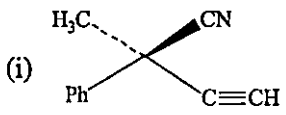
(c) Which of the following molecules are IR-active? Give reasons.

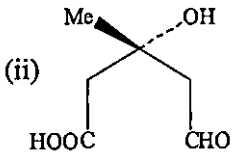
H_2, CO_2, HCl. 6

(d) Adsorption of a gas by solid is an exothermic process. — Justify or Criticize. 2

Group-B

6. (a) Assign R/S descriptors of the following compounds indicating priority sequences. 2+2

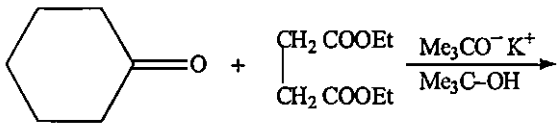




(b) Pure (–) enantiomer of an optically active compound'A' has a specific rotation of $[\alpha]_D^{20} = -44.8°$. What is the optical purity of a sample of A, which shows a specific rotation of –26.88°? How much of each enantiomer is present in the enantiomeric mixture? 4

(c) Predict the most stable conformation of 1-methyl-1-phenylcyclohexane. 4

(d) Predict the product and carry out the following Stobbe condensation reaction. 4



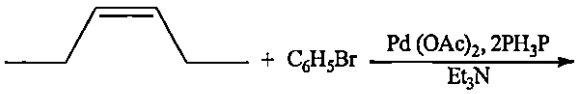
(e) In the thermal ring opening of trans–3, 4–dimethylcyclobutene, two products can be formed by conrotatory mode, but only one is actually formed. Identify the pssible products. Which one is observed and why? 4

7. (a) Draw the Fischer, Sawhorse and Newman projection formulae (Staggered) of CH_2OH–CHCl–CHBr–CHO. 3

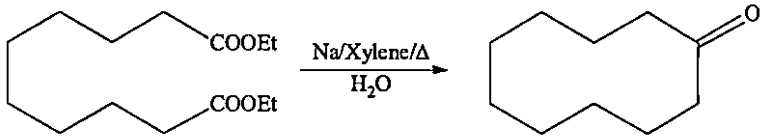
(b) Draw the Newman projection formulae of 2,3-butanediols in their most stable conformations with proper reason. 5

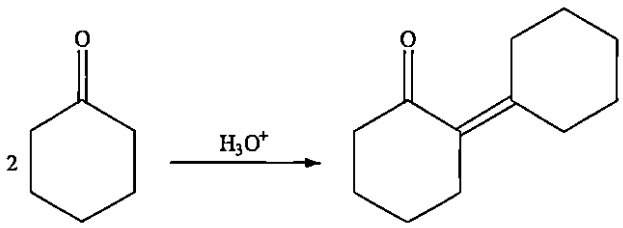
(c) Predict the product(s) with mechanism. 6+6

(i) $CH_3CH{=}CH_2 \xrightarrow[UV]{NBS,\ CCl_4}$

(ii)  $+\ C_6H_5Br \xrightarrow[Et_3N]{Pd(OAc)_2,\ 2PH_3P}$

8. (a) Write down the mechanism of the following reaction. 5+5

(i) 

(ii) 

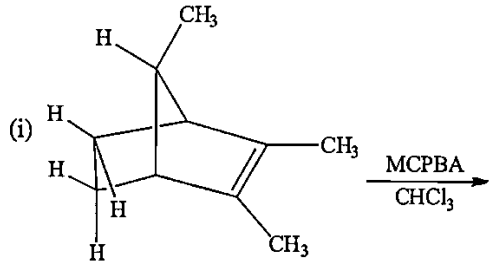
(b) Using correlation orbital diagram show that thermal dimerisation of ethylene to cyclobutane is a disallowed interaction. 10

9. (a) Draw the two conformations of 1,3-butadiene. Which one of them is more stable? Give your reasoning. 3

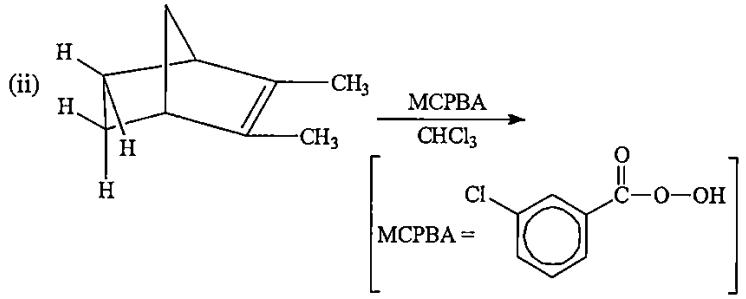
(b) Arrange the staggered conformations of 2,3-dimethylbutane in order of decreasing energy. 2

(c) Predict the major and minor products in each of the following reactions and give the reasonings. 4

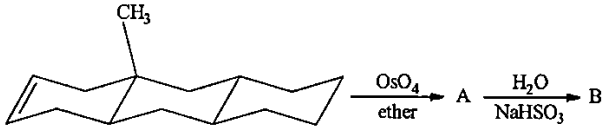
(i)



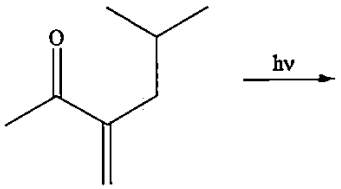
(ii)



(d) Identify the product (with Stereochemistry if approapriate) obtained in each step of the following reaction sequences: 3

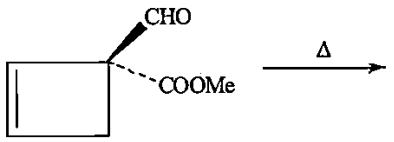


(e) Complete the following photochemical reaction with mechanism. 8

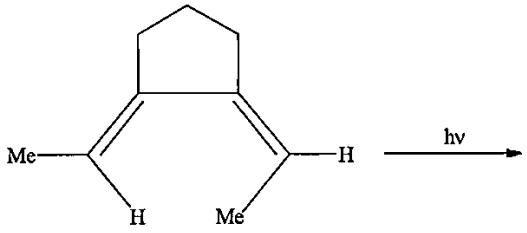


10. Predict the product(s) in the following reactions. Explain their formation. 4×5=20

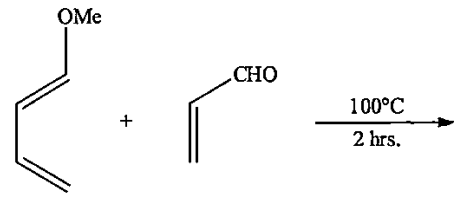
(i)

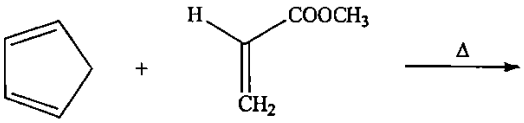


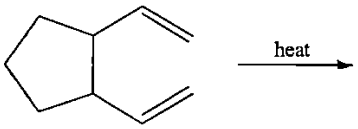
(ii)



(iii)



(iv) 

(v) 

Group-C

11. (a) What would be the spin only magnetic moment value of Mn^{2+} in $[Mn(H_2O)_6]Cl_2$? 4

    (b) Account for the observation that two separate water exchange rates are found for $[Cu(H_2O)_6]^{2+}$ in aqueous solution. 4

    (c) Draw the facial and meridional isomers of $[Co(NH_3)_3(NO_2)_3]$. 2+2

    (d) Give examples of one doubly bridging and one triply bridging nitrosyl compounds. 4

    (e) Write a short note on active transport across the membranes. 4

12. (a) F-Xê-O angle in XeOF4 is nearly 90°. — Justify. 4

    (b) Explain the order of LMCT transition energies: $MnO_4^- < TcO_4^- < ReO_4^-$ 4

    (c) Draw the structures of the isomers of $[Co(en)(NH_3)_2Cl_2]^+$ and indicate the types of isomerism. 6

    (d) The mean pairing energy (p) of $[Cr(H_2O)_6]^{+2}$ ion is found to be 23500 cm^{-1}. The magnitude of Δ_0 is 13900 cm^{-1}. Calculate the CFSE for this complex ion for both high spin and low spin state. 3+3

13. (a) Which of the following two complexes $[Co(NH_3)_6]^{+3}$ and $[Fe(NH_3)_6]^{+3}$ is labile and inert? Cite an example of coordination isomer. 2+2

    (b) Define the term 'oxidative addition reaction'. What condition must be met for such a reaction to occur? 4+2

    (c) Comment on the different V-C bond lengths in $[V(CO)_6]$ and $[V(CO)_6]^-$ compounds. 4

    (d) Give an example of each trace elements and ultratrace elements of metal ion in biological system. Mention any two biological function of redox-active transition metals such as copper (Cu) and iron (Fe). 2+2+2

14. (a) Explain why $Ni(CO)_4$ is tetrahedral while $Ni(CN)_4^{2-}$ is square planner? 3+3

(b) Explain why $[Ni(en)_3]^{2+}$ is more stable than $[Ni(NH_3)_6]^{2+}$? 4

(c) Describe ambidentate ligand with proper examples. 4

(d) Write the formula of pentaammine(dinitrogen)ruthenium(III)chloride. The high-spin d^4 complex $[Cr(H_2O)_6]^{2+}$ is labile, but the low-spin d^4 complex ion $[Cr(CN)_6]^{4-}$ is inert. —Explain. 2+4

15. (a) Using 18 electron rule as a guide find the number of metal-metal bonds in the following compounds:

$Co_4(CO)_{12}$, $Os_3(CO)_{12}$, $Rh_6(CO)_{16}$ 2+2+2

(b) Compare C–C bond length in $[PtCl_3(C_2H_4)]^-$ and $[PtCl_3(C_2F_4)]^-$. 4

(c) Give one example of each non-heme electron transfer protein and heme electron transfer protein. Also comment on the number of metal centre(s) present in the active site structure of the proteins. 2+2

(d) What is the role of globin protein in hemoglobin? What are the effects of Zn deficiency? 4+2

2023

PSYCHOLOGY

PAPER-I

Time Allowed – 3 Hours | Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.

Group –A

Answer any three from the following.

1. (a) Write the scope of Psychology in society and academic world
   (b) Discuss with diagram the functions of Brain 15+25

2. (a) Briefly discuss Movement, Space, Depth and Time perception. 5+5+5+5
   (b) What do you mean by Perceptual organization? Critically evaluate Gestalt view of perception. 20

3. (a) What is Intelligence? Critically discuss Spearman's Two-Factor theory. How it differs from Thurstone theory? 5+25
   (b) Write the concept of I.Q. Write the classification and deviation of I.Q. 10

4. (a) Critically write Piaget's theory of Cognitive Development. 25
   (b) What are the basic elements of thinking? Write the characteristics of Creative Thinking. 15

5. (a) Write the basic difference between James-Lang and Cannon-Bard theory of emotion. 20
   (b) Critically discuss Schachter-Singer theory of emotion. 20

6. Write short notes on any four : 10x4

   (a) Weber-Fechner Law
   (b) Classical conditioning
   (c) Multiple Intelligence
   (d) Effect of motivation on behavior
   (e) Types of memory

Group – B

Answer any two from the following:

7. Critically write following theories of motivation: 20+20

   (a) Maslow
   (b) MaClelland

P.T.O.

8. Discuss the concept of 15+15+10

(a) Emotional Development
(b) Social Development

Write the contribution of these in child's wholesome development.

9. Write short notes on : 10x4

(a) Programmed Learning
(b) Prejudice an discrimination
(c) Concept of value development
(d) Theories of forgetting

2023

PSYCHOLOGY

PAPER-II

Time Allowed – 3 Hours | Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.

Group –A

Answer any three from the following.

1. Critically discuss 'Topography of Mind' and 'Structure of Mind' according to Freud'. Briefly write Psychosexual stages as proposed by Freud. 15+15+10

2. Write elaborately the clinical features of schizophrenia – it's probable causes and suggested therapies. 40

3. Critically discuss the characteristics and differences between Psychoanalysis and Cognitive Behaviour Therapy. 40

4. Write about:

   (a) Problem of social integration
   (b) Delinquency and Crime 20+20

5. Write elaborately the clinical features of Mood Disorder – it's probable causes and suggested management programme. 40

6. Write short notes on any four: 10x4

   (a) Roger's theory of personality
   (b) Rehabilitation Psychology
   (c) Criteria of adjustment
   (d) Generalized Anxiety disorder
   (e) Steps of test construction

Group –B

Answer any two from the following:

7. What are the major criteria of job satisfaction? Write about the sources and types of organizational conflict. How it affects occupational health? 10+20+10

8. Define Leadership. Write the major characteristics, role and quality of a group leader. Write the differences between transactional and transformational leadership. 10+30

9. Write notes on any four of the following: 10x4

(a) Normal Probability Curve
(b) Parametric and non-parametric approach
(c) Hypothesis – types and use in statistics
(d) Research variables
(e) Types of sample

2023

BENGALI

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

(উত্তর সাধু বা চলিত যেকোনো একটি ভাষারীতিতে হওয়া বাঞ্ছনীয়।)

'ক' বিভাগ

(*যেকোনো একটি* প্রশ্নের উত্তর লিখুন।) ৫০×১=৫০

১। (ক) প্রাচীন বাংলা, মধ্য বাংলা ও আধুনিক বাংলার কালসীমা নির্দেশ করুন এবং প্রতিটি স্তরের ভাষাতাত্ত্বিক বৈশিষ্ট্য উদাহরণসহ লিখুন।

(খ) বাংলা শব্দভাণ্ডারের বৈশিষ্ট্য ও বৈচিত্র্য প্রয়োজনীয় দৃষ্টান্তসহ উল্লেখ করুন।

'খ' বিভাগ

(*যেকোনো দুটি* প্রশ্নের উত্তর লিখুন।) ৫০×২=১০০

২। কাব্যের নাম 'শ্রীকৃষ্ণকীর্তন', কিন্তু কাব্যটি 'রাধাসর্বস্ব'। 'কাব্যটির যাহা কিছু ঐ একটি চরিত্র।'—এই মন্তব্যের পক্ষে আপনার অভিমত যুক্তিসহ লিখুন।

৩। মুকুন্দ চক্রবর্তী এবং রায়গুণাকর ভারতচন্দ্র দু'জনেই কেন তাঁদের কাব্যকে যথাক্রমে 'নৌতন মঙ্গল' এবং 'নূতন মঙ্গল' বলে অভিহিত করেছেন আলোচনা করুন।

৪। বাংলা আখ্যানকাব্যের ধারায় পুরাণ ও ইতিহাসের পুনর্মূল্যায়নে রঙ্গলাল, হেমচন্দ্র ও নবীনচন্দ্রের কবিকৃতির পরিচয় দিন।

৫। উনিশ শতকের বাংলা প্রহসনে সমকালীন সমাজজীবন কীভাবে প্রতিফলিত হয়েছে মাইকেল মধুসূদন দত্ত ও দীনবন্ধু মিত্রের রচনা অনুসরণে উল্লেখ করুন।

'গ' বিভাগ

(*যেকোনো একটি* প্রশ্নের উত্তর লিখুন।) ৫০×১=৫০

৬। বাংলা উপন্যাসের ধারায় রবীন্দ্রনাথ ঠাকুরের স্বতন্ত্রতা নিয়ে আলোচনা করুন।

৭। তারাশঙ্কর বন্দ্যোপাধ্যায়ের উপন্যাসে রাঢ় বাংলার প্রকৃতি ও মানুষ কীভাবে চিত্রিত হয়েছে তাঁর যেকোনো দুটি উপন্যাসের সাপেক্ষে বুঝিয়ে দিন।

৮। ঐতিহাসিক ও সামাজিক উপন্যাস রচনায় স্বর্ণকুমারী দেবীর কৃতিত্বের পর্যালোচনা করুন।

2023

BENGALI

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

(উত্তর সাধু বা চলিত যেকোনো একটি ভাষারীতিতে হওয়া বাঞ্ছনীয়।)

বিভাগ-ক

(*যেকোনো তিনটি* প্রশ্নের উত্তর লিখুন।) ৪০×৩=১২০

১। বৈষ্ণব পদাবলী সাহিত্যে 'পূর্বরাগ' বলতে কী বোঝায়? শ্রীকৃষ্ণ ও শ্রীরাধার পূর্বরাগ বিষয়ক পদে বিদ্যাপতি ও চণ্ডীদাসের কবিকৃতির আলোচনা করুন।

২। "নিপুণ পর্যবেক্ষণ, সহৃদয়তা, জীবনে আস্থা, ব্যাপক অভিজ্ঞতা ইত্যাদি যে সব গুণ ভালো উপন্যাসলেখকের প্রত্যাশিত, সে সব গুণ সেকালের পক্ষে যথোচিত পরিমাণে, মুকুন্দরামের কাব্যে পাই।"—চণ্ডীমঙ্গল কাব্য অবলম্বনে এই মন্তব্যের গ্রহণযোগ্যতা বিচার করুন।

৩। 'মেঘনাদবধ কাব্য' অবলম্বনে চিত্রাঙ্গদা ও প্রমীলা চরিত্র-পরিকল্পনায় মধুসূদনের কবিদৃষ্টির স্বতন্ত্রতা বিশ্লেষণ করুন।

৪। "বঙ্কিমচন্দ্রের কপালকুণ্ডলার যে শক্তি পাঠককে চুম্বকের মতো আকর্ষণ করে তা' হল strangeness; এ strangeness ভৌগোলিক strangeness নয়, এর নিধান কপালকুণ্ডলার চরিত্রে।"—এই মন্তব্যের আলোকে কপালকুণ্ডলা চরিত্রের অভিনবত্ব পর্যালোচনা করুন।

৫। "এই গ্রন্থের পরিচয় আছে 'বাজে কথা' প্রবন্ধে। অর্থাৎ ইহার যদি কোনো মূল্য থাকে তাহা বিষয়বস্তু গৌরবে নয়, রচনারস সম্ভোগে।"— 'বিচিত্র প্রবন্ধ' গ্রন্থের সূচনায় রবীন্দ্রনাথের এই উক্তি গ্রন্থটিতে কীভাবে সার্থক হয়ে উঠেছে প্রাসঙ্গিক উদাহরণসহ আলোচনা করুন।

বিভাগ-খ

(*যেকোনো দুটি* প্রশ্নের উত্তর দিন।) ৪০×২=৮০

৬। ঐতিহাসিক নাটক হিসেবে দ্বিজেন্দ্রলাল রায়ের 'চন্দ্রগুপ্ত' নাটকের সার্থকতা বিচার করুন।

৭। "প্রমথনাথ চৌধুরী বাঙ্গালা গদ্যের একটি বিশিষ্ট রীতির প্রবর্তক। এই রীতির অতিশায়িত রূপকে 'বীরবলী' ভঙ্গি বলা হয়।"—পঠিত প্রবন্ধ অবলম্বনে প্রমথ চৌধুরীর রচনায় এই 'বিশিষ্ট রীতি'র পরিচয় দিন।

৮। 'পথের পাঁচালী' উপন্যাসে কীভাবে সমকালের আর্থ-সামাজিক পরিস্থিতি, পারিবারিক জীবন এবং সাংস্কৃতিক পরিবেশ প্রতিফলিত হয়েছে, লিখুন।

৯। ছেচল্লিশের সাম্প্রদায়িক দাঙ্গার প্রেক্ষিতে সমরেশ বসুর 'আদাব' গল্পটির গুরুত্ব ও শিল্পমূল্য বিচার করুন।

2023

MECHANICAL ENGINEERING

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answers may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and same language.*

Answer any five *questions.*

1. (a) An open belt drive is required to transmit 9·5 kW of power from a motor running at 580 rpm. Diameter of the driving pulley is 250mm. The speed of the driven pulley is 200 rpm. The belt is 12mm thick and has a mass density of 0·001g/mm^3. Safe stress in the belt is not to exceed 2·5 N/mm^2. The two shafts are 1·25m apart. The coefficient of friction is 0·25. Determine the width of the belt.

   (b) In a porter governor, each of the four arms is 380mm long. The upper arms are pivoted on the axis of the sleeve whereas the lower arms are attached to the sleeve at a distance of 40mm from the axis of rotation. Each ball has a mass of 7kg and the load on the sleeve is 55kg. What will be the equilibrium speeds for the two extreme radii of 250mm and 300mm of rotation of the governor balls. 20+20

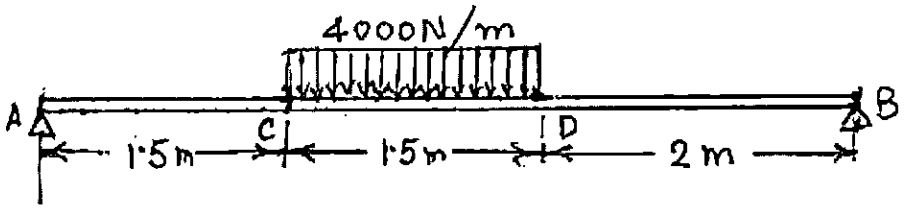
2. (a) In an unconvensional Machining process what is EDM? Explain its principle and working with the help of suitable diagram mentioning its important characteristics.

   (b) Write down its merits, demerits and applications. (5+15)+20

3. (a) Describe, with a neat sketch, the working principle of Laser Beam Machining (LBM) mentioning its characteristics.

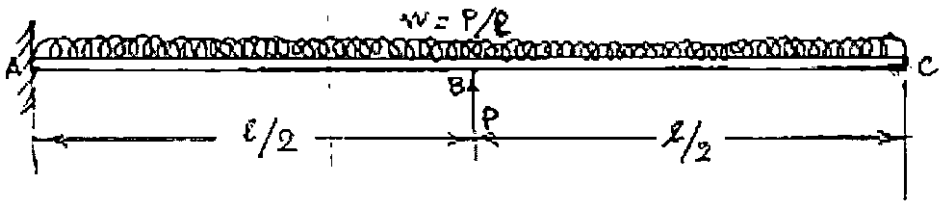
   (b) State its advantages, disadvantages and applications. 20+20

4. (a) Draw the shear force and bending moment diagrams for the beam shown below. Find also the position and magnitude of the maximum bending moment.



(b) Determine the slope and deflection at the end C of the cantilever ABC as shown below.

20+20



5. (a) What is 'Inventory Control'? What are its objectives?

(b) Explain briefly 'ABC analysis'.

(c) What is 'Economic Ordering Quantity'?

(d) The manager of a factory is purchasing forgings of outer-ring ₹ 10,000 annually. Records reveal that cost of an order is ₹ 15, cost of inventry carrying is 9% of the average inventry value and unit price is ₹ 65.

Obtain the following:

(i) Economic Ordering Quantity (Q_{opt}), and

(ii) Optimum Number of Orders per year 15+8+5+12

6. (a) The angle between the axes of two shafts joined by Hooke's joint is 25°. The driving shaft rotates at a uniform speed of 180rpm. The driven shaft carries a steady load of 7·5 kW. Calculate the mass of the flywheel of the driven shaft if its radius of gyration is 150mm and the output torque of the driven shaft does not vary by more than 15% of the input shaft.

(b) The following data relate to a shaft held in long bearings.

Length of the shaft	= 1·2 m
Diameter of shaft	= 14 m
Mass of a rotor at midpoint	= 16 kg
Eccentricity of centre of mass of rotor from centre of rotor	= 0·4 mm
Modulus of elasticity of shaft material	= 200 GN/m^2
Permissible stress in shaft material	= $70\times10^6 N/m^2$

Determine the critical speed of the shaft and the range of speed over which it is unsafe to run the shaft. Assume the shaft to be massless. 20+20

7. (a) Write short note on "sub zero treatment of steel".

(b) What is retained austemite? Why is it not desirable? How can it be eliminated.

(c) Distinguish between full annealing and process annealing.

(d) State composition, properties and uses of carbon steels. 8+15+8+9

2023

MECHANICAL ENGINEERING

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and same language.*

Answer *any five* questions.

1. (a) A cylinder fitted with a movable piston contains 0·04 m^3 of air at 10 bar pressure and 400 K temperature. The air expands according to the law $p = \left[\frac{A}{V^2} - \frac{B}{V}\right]$ to a final pressure of 1 bar and volume 0.2 m^3. Determine work done, change in internal energy and heat absorbed or rejected during the expansion process. Assume C_v = 0·718 KJ / Kg.K.

   (b) A heat pump operates between two identical systems, both being at temperature T_1 start with. Due to pump operation, one of the systems gets cooled down to temperature T_2. Show that for this operation of pump, the minimum work required by the heat pump is

$$W_{min} = C\left[\frac{T_1^2}{T_2} + T_2 - 2T_1\right]$$ 15+25

2. (a) What is mep? Derive an expression of mep in terms of r, $\propto$, p_1 and γ for Otto cycle.

   (b) In a diesel engine the pressure volume and temperature at the beginning of compression are 1·0 bar $1m^3$ and 30°C. The volume ratio of compression and expansion are 15·0 and 7.5 respectively. Determine the mean effective pressure, the ratio of maximum pressure to mean effective pressure and cycle efficiency. Find also fuel consumption per kWh if indicated thermal efficiency is 0.5 of ideal efficiency, Calorific value of fuel is 41,000 KJ / Kg, mechanical efficiency is 0·8. For air C_P = 1·005 KJ / KgK, C_v = 0·718 KJ / Kg and γ =1·4.

   (Assume V_1 =1 m^3) 15+25

3. (a) In a vertical pipe line carrying oil of sp.gr 0·92, a 25 cm× 15 cm venturimeter is provided. The flow being upwards. The difference in elevation of the throat section and entrance section of the venturimeter is 30 cm. The differential U tube Hg manometer shows a gauge difference of 25 cm. Calculate

   (i) the discharge of oil and

   (ii) pressure difference between entrance and throat section. Assume coefficient of discharge as 0·96 and sp·gr of Hg as 13·6.

(b) The outlet width of an impeller of a centrifugal pump with outer diameter 400 mm is 50 mm. The pump speed is 800 rpm and is working against a total head of 15 m. The Vane angle at outlet is 40° and manometric efficiency is 78%. Determine the following:

(i) Velocity of water leaving the vane

(ii) Velocity of flow at outlet

(iii) Angle made by the absolute velocity at outlet with the direction of motion at outlet, and

(iv) Discharge. 20+20

4. (a) Air at 1atm and 27°C flows over a flat plate at a speed of 2·5 m/s. Calculate the boundary layer thickness at a distance of 0·2 m and 0·4 m from the leading edge of the plate. Calculate the mass flow rate which enters the boundary layer between $x = 0{\cdot}2$ m and $x = 0{\cdot}4$ m. The viscosity of air at 27°C is $1{\cdot}85 \times 10^{-5}$ Kg / ms. Assume unit depth in Z direction.

(b) Water at 0·8 Kg/s at 85°C flows through a steel tube having 25 mm ID and 30 mm OD. The outside surface temperature of the pipe is 80°C and temperature of surrounding air is 20°C. The room pressure is 1 atm and pipe length is 15 m. How much heat is lost by free convection in the room?

Use Correlation :

$Nu = 0{\cdot}53\ (Gr.\ Pr)^{0.25}$ for $10^4 < GrPr < 10^9$

$Nu = 0{\cdot}10\ (Gr.\ Pr)^{1/3}$ for $10^9 < GrPr < 10^{12}$

Properties of air as :

$C = 1{\cdot}0877$ Kg / m^3 $C_P = 1{\cdot}0073$ KJ / Kg.K

$\mu = 1{\cdot}9606 \times 10^{-5}$ Kg / m.s $K_f = 0{\cdot}02813$ W / m.K 20+20

5. (a) What are the considerations to be made while selecting a suitable site for a thermal and nuclear power plant?

(b) What is balanced draught? Explain with neat sketches.

(c) A power plant has Load factor 0·7, Capacity factor 0·60, Use factor 0·65. Maximum demand is 60 MW. Estimate the following:

(i) The annual energy production.

(ii) Reserve capacity over and above the peak load.

(iii) The hours during which the plant is not in service per year. 20+5+15

6. (a) Write notes on detonation.

   (b) A 4 stroke six cylinder SI engine has a bore of 75 mm and stroke of 90 mm. Its fuel consumption is 20 Kg / hr and developes a torque of 150 Nm while running at a mean speed of 12 m/s. Assuming a clearance volume of 75 cm^3 per cylinder, determine

   (i) brake power and brake mean effective pressure.

   (ii) brake thermal efficiency if the calorific value of fuel used is 42·0 MJ / Kg.

   (iii) relative efficiency on the basis of brake power. 15+25

7. (a) Establish a relation for the shape factor of a conical cavity of diameter d and depth h.

   (b) In a counter flow double pipe heat exchanger, water is heated from 30°C to 65°C by an oil with specific heat of 1·45 KJ / Kg. K and mass flow rate of 1·0 Kg / s. The oil is cooled from 200°C to 150°C. If the overall heat transfer coefficient is 410 W / m^2°C, calculate the following:

   (i) Heat transfer rate

   (ii) Mass flow rate of water and

   (iii) The surface area of the heat exchanger. 15+25

2023

MATHEMATICS

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

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*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

1. *Answer* any two *questions:* 10×2=20

(a) If U = L {(1, 2, 1), (2, 1, 3)}, W = L {(1, 0, 0), (0, 0, 1)}, show that U and W are subspaces of $\mathbb{R}^3$. Determine dim U, dim W, dim (U∩W). Deduce that dim (U + W) = 3. 2+2+4+2

(b) Determine the linear mapping $T:\mathbb{R}^3\to\mathbb{R}^3$, which maps the basis vectors (0, 1, 1), (1, 0, 1), (1, 1, 0) of $\mathbb{R}^3$ to (1, 1, 1), (1, 1, 1), (1, 1, 1) respectively. Verify that dim (Ker T) + dim (ImT) = 3. 5+5

(c) Diagonalize the symmetric matrix A, where $A=\begin{pmatrix}4 & 2 & 2\\ 2 & 4 & 2\\ 2 & 2 & 4\end{pmatrix}$. 10

2. *Answer* any two *questions:* 10×2=20

(a) Prove that the sequence $\{u_n\}$ defined by $u_1=\sqrt{7}$ and $u_{n+1}=\sqrt{7+u_n}$ for all $n\geq 1$ converges to the positive root of the equation $x^2-x-7=0$ 10

(b) Find a and b in order that $\lim\limits_{x\to 0}\dfrac{a\sin 2x-b\sin x}{x^3}=1$. 10

(c) Show that the envelope of circles whose centres lie on the rectangular hyperbola $xy=c^2$ and which passes through its centre is $\left(x^2+y^2\right)^2=16c^2xy$. 10

3. *Answer* any two *questions:* 10×2=20

(a) Using the definition of a compact set, prove that a finite subset of $\mathbb{R}$ is a compact set in $\mathbb{R}$. 10

(b) Prove that the integral $\int_a^b \dfrac{dx}{(x-a)^\mu}$ is convergent if and only if $\mu<1$. 10

(c) Test the convergence of the series

$$\frac{1}{2}+\frac{1}{3}+\frac{1}{2^2}+\frac{1}{3^2}+\frac{1}{2^3}+\frac{1}{3^3}+\cdots$$ 10

4. *Answer* any two *questions:* 10×2=20

(a) Prove that $\frac{\pi^2}{9} < \int_{\pi/6}^{\pi/2} \frac{x}{\sin x} dx < \frac{2\pi^2}{9}$. 10

(b) Find the asymptotes of $x^3 + x^2y - xy^2 - y^3 + x^2 - y^2 = 2$. 10

(c) Let $f_n(x) = \frac{x}{n + x^2}, x \in [0,1]$. Show that the sequence $\{f_n\}$ is uniformly convergent on $[0,1]$. 10

5. *Answer* any two *questions:* 10×2=20

(a) Reduce the equation $3x^2 + 2xy + 3y^2 - 18x - 22y + 50 = 0$ to its standard form by applying a rotation $\frac{\pi}{4}$ which is followed by a translation about the point (2, 3). 10

(b) Find the product of the perpendiculars from (x_1, y_1) to the straight lines represented by $ax^2 + 2hxy + by^2 = 0$. 10

(c) Show that the locus of the middle points of normal chords of the rectangular hyperbola $x^2 - y^2 = a^2$ is $(y^2 - x^2)^3 = 4a^2x^2y^2$. 10

6. *Answer* any two *questions:* 10×2=20

(a) A variable plane at a constant distance p from the origin meets the axes at A, B, C. Show that the locus of the centroid of the tetrahedron $OABC$ is $\frac{1}{x^2} + \frac{1}{y^2} + \frac{1}{z^2} = \frac{16}{p^2}$. 10

(b) Find the equations of the tangent planes to the conicoid $2x^2 - 6y^2 + 3z^2 = 5$ which pass through the straight line $x + 9y - 3z = 0 = 3x - 3y + 6z - 5$. 10

(c) Find the equations to the generating lines of the hyperboloid $\frac{x^2}{4} + \frac{y^2}{9} - \frac{z^2}{16} = 1$, which pass through the point (2, 3, – 4). 10

7. *Answer* any two *questions:* 10×2=20

(a) Find the orthogonal trajectories of cardioids $r = a(1 - \cos\theta)$, a being a parameter. 10

(b) Solve : $(D^2 - 2D + 1)y = x^2e^x$ 10

(c) Solve the Euler – Cauchy equation : $(x^2D^2 - xD + 2)y = x\log x$ 10

8. *Answer* any two *questions:* 10×2=20

(a) Solve : $(x^2-y^2-z^2)p+2xyq=2xz$ 10

(b) Using Charpit's method find a complete integral of the *PDE* $px+qy=pq$. 10

(c) Solve $(D^2+6D+9)y=\sin t$ using Laplace transform, where $y(0)=1, y^1(0)=0$. 10

9. *Answer* any two *questions:* 10×2=20

(a) A square frame *ABCD* of four equal joined rods hangs from *A*, the shape being maintained by a string joining mid-points of *AB, BC.* Prove that the ratio of the tension of the string to the reaction at *C* is $\frac{8}{\sqrt{5}}$. 10

(b) A perfectly rough plane is inclined at an angle α to the horizon. Show that the least eccentricity of the ellipse which can rest on the plane is $\sqrt{\frac{2\sin\alpha}{1+\sin\alpha}}$. 10

(c) A force *p* acts along the axis of *x* and another force *np* acts along a generator of the cylinder $x^2+y^2=a^2$; show that the central axis lies on the cylinder $n^2(nx-z)^2+(1+n^2)^2y^2=n^4a^2$. 10

10. *Answer* any two *questions:* 10×2=20

(a) A mass *m* when suspended from a light spring causes an extension α. If a mass *M* is added to *m*, find the periodic time of the ensuing oscillation together with the amplitude of the oscillation. 10

(b) If the orbit described by a particle under a central force to the origin be $r^n\cos n\theta=a^n$, find the law of force. 10

(c) A body is projected horizontally from a point on the earth's surface with the velocity $\sqrt{1{\cdot}5Rg}$, *R* being the earth's radius. What will be its maximum distance from the earth's centre? 10

2023

MATHEMATICS

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any five* questions. (14+14)×5=140

1. (a) Solve the system of linear congruences 14

$$x \equiv 1(\text{mod } 3),$$
$$x \equiv 2(\text{mod } 5),$$
$$x \equiv 3(\text{mod } 7).$$

(b) Using De Moivre's theorem prove that $\sin^4\theta \cos^2\theta = \frac{1}{32}[cos6\theta - 2\cos4\theta - \cos2\theta + 2]$. 14

2. (a) If α, β, γ are the roots of $x^3 + 3x + 2 = 0$, then find (i) $\sum \alpha^5$ (ii) $\sum \alpha\beta(\alpha + \beta)^3$. 7+7

(b) Find the special roots of the equation $x^9 - 1 = 0$ and show that they are roots of the equation $x^6 + x^3 + 1 = 0$. 14

3. (a) If H and K be two finite subgroups of a group (G, .), then show that

$$\circ(HK) = \frac{\circ(H) . \circ(K)}{\circ(H \cap K)}$$ 14

(b) Let R be a commutative ring with unity, then prove that Ra is a principal ideal of R, generated by $a \in R$. 14

4. (a) Let V be a function of two variables x and y and $x = r\cos\theta$, $y = r\sin\theta$, then prove that

$$\frac{\partial^2 V}{\partial x^2} + \frac{\partial^2 V}{\partial y^2} = \frac{\partial^2 V}{\partial r^2} + \frac{1}{r^2}\frac{\partial^2 V}{\partial \theta^2} + \frac{1}{r}\frac{\partial V}{\partial r}.$$ 14

(b) Evaluate $I = \iint_S \left(xdydz + dzdx + xz^2dxdy\right)$, where S is the outer side of the part of the sphere $x^2 + y^2 + z^2 = 1$ in the first octant. 14

5. (a) Show that the vector $\vec{V} = (4xy - z^3)\hat{\imath} + 2x^2\hat{\jmath} - 3xz^2\hat{k}$ is irrotational. Also show that $\vec{V}$ can be expressed as the gradient of some scalar function ϕ. 14

(b) Verify Stokes' theorem for $\vec{F} = (2x - y)\hat{\imath} - yz^2\hat{\jmath} - y^2z\hat{k}$, where S is the upper half surface of the sphere $x^2 + y^2 + z^2 = 1$ and C is its boundary. 14

6. (a) Let X be the set of all continuous real-valued functions defined on [0, 1], and let $d(x,y) = \int_0^1 |x(t) - y(t)|dt, \forall x, y \in X$, show that (X, d) is not a complete metric space. 14

(b) Let $f(z) = \begin{cases} \frac{xy^2(x+iy)}{x^2+y^4}, & z \neq 0 \\ 0, & z = 0 \end{cases}$

show that $f(z)$ is not analytic at the origin though it satisfies Cauchy – Riemann equations. 14

7. (a) Calculate by Simpson's one-third rule, the value of the integral $\int_0^1 \frac{x\,dx}{1+x}$ correct up to three significant figures, by taking six intervals. 14

(b) Solve the following system of equations by Gauss-Seidel iteration method (up to 3rd approximations). 14

$$20x + 2y + z = 30$$
$$x - 40y + 3z = -75$$
$$2x - y + 10z = 30$$

Group-B

Answer *any five* questions. 12×5=60

8. (a) Write the function $(xy' + xz)' + x'$ in CNF.

(b) Find the complement of $f = (x + y')(x' + y)$. 6+6

9. $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ gives the roots of a quadratic equation $ax^2 + bx + c = 0$. Draw a flow chart to solve for real value of x. 12

10. Determine the optimal basic solution to the following transportation problem: 12

	1	2	3	4	a_i
1	2	3	11	7	6
2	1	0	6	1	1
3	5	8	15	9	10
b_j	7	5	3	2	

11. Consider the problem of assigning four operators to four machines. The assignment costs in rupees are given here. Operator 1 cannot be assigned to machine III and operator 3 cannot be assigned to machine IV. Find the optimal cost of assignment. 12

		Machines			
		I	II	III	IV
Operators	1	5	5	—	2
	2	7	4	2	3
	3	9	3	5	—
	4	7	2	6	7

12. If the probability density function of a random variable is given by

$f(x) = ce^{-(x^2+2x+3)}$, $-\infty < x < \infty$, find the value of the constant c, the expectation and variance of the distribution. 4+3+5

13. The pdf of a random variable X is assumed to be of the form $f(x) = cx^{\alpha}, 0 \leq x \leq 1$ for some number and constant c. If $X_1, ..., X_n$ is a random sample of size n, find the maximum likelihood estimate of α. 12

14. Obtain the basic feasible solutions of the system of equations 12

$$x_1 + 4x_2 - x_3 = 5$$
$$2x_1 + 3x_2 + x_3 = 8\,.$$

2023

ECONOMICS

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Answer *any five* questions taking at least two from each group.

Group-A

1. (a) A consumer spends his/her entire income on two goods. The consumer faces a given income and prices.

   (i) Show that both goods cannot simultaneously be inferior or luxury.

   (ii) Show that if with the increase in income, the share of expenditure on a good rises, then the good is income elastic in demand.

   (b) "Diminishing marginal utility is neither necessary nor sufficient for convexity of indifference curves". Examine the validity of the statement. (10+10)+20=40

2. (a) What are the properties of Cobb-Douglas production function?

   (b) Consider the production function $Q = 2L^{0.75} \cdot K^{0.25}$

   What will be the percentage change in output (Q) when

   (i) L rises by 8% and K rises by 6%?

   (ii) L rises by 4% and K falls by 12%?

   (c) Derive the value of the elasticity of input substitution for the production function

   $$Q = A\left[\alpha L^{-\beta} + (1-\alpha)K^{-\beta}\right]^{-\frac{1}{\beta}},\ 0 < \alpha < 1, A > 0, \beta > 0$$ 10+(5+5)+20=40

3. (a) Determine the maximum profit and the corresponding marginal price and quantity for a perfectly discriminating monopolist whose demand and cost functions are $P = 2200 - 60Q$ and $C = 0 \cdot 5Q^3 - 61 \cdot 5Q^2 + 2740Q$, respectively.

(b) In a duopoly market (without product differentiation) the market demand and cost functions are given by

$$P = 100 - 0 \cdot 5(Q_1 + Q_2), C_1 = 5Q_1, C_2 = 0 \cdot 5Q_2^2$$

Where Q_1 and Q_2 are outputs of the two firms.

Derive profit maximizing values of Q_1, Q_2 and P under Cournot competition.

(c) What are externalities and what is the consequence of the presence of externalities in the context of resource allocation? Explain with suitable examples from production and consumption. 10+20+10=40

4. (a) What is Balanced Budget Multiplier theorem and what is its significance? Analyse the situations when the value of the balanced budget multiplier is (i) one, (ii) less than one and (iii) greater than one.

(b) What is crowding out? Explain. What is the role of the interest elasticity of money demand in crowding out? Under what circumstances the LM curve may be positively sloped even in the absence of the speculative demand for money? Explain. 20+20=40

5. (a) State and prove the knife-edge problem in the Harrod growth model.

(b) What do you mean by steady state? Derive the fundamental equation of growth in Solow model in the absence of depreciation. 20+20=40

Group-B

6. (a) State and prove the Heckscher-Ohlin theorem in terms of physical definition of factor abundance.

(b) What is Rybczynski Theorem? Establish it in terms of a 2-good-2factor model. 20+20=40

7. (a) Examine the effects of imposition of import tariff by a small country in terms of a partial equilibrium model.

(b) Show that in the presence of perfect capital mobility and fixed exchange rate regime, while monetary policy is ineffective, fiscal policy is effective. 20+20=40

8. (a) Examine situations that may require government intervention in an economy.

(b) Discuss Lindahl model in the context of optimal provision of a public good. What are the limitations of Lindahl model? 20+20=40

9. (a) State and explain the significance of the assumptions of classical linear regression model (CLRM).

   (b) The table below gives the real per capita income in thousands of U.S. dollars (Y) with the percentage of labour force in agriculture (X_1) and the average years of schooling of the population over 25 years of age (X_2) for 15 countries in 1981.

N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Y	6	8	8	7	7	12	9	8	9	10	10	11	9	10	11
X_1	9	10	8	7	10	4	5	5	6	8	7	4	9	5	8
X_2	8	13	11	10	12	16	10	10	12	14	12	16	14	10	12

   (i) Find the least-squares regression equation of Y on X_1 and X_2.

   (ii) Calculate R^2 and interpret the equation. 20+20=40

10. Write short notes on *any two* of the following: 20+20=40

   (a) Ricardian Equivalence Theorem

   (b) Coase Theorem

   (c) Canons of taxation

   (d) Relative measures of dispersion

2023

ECONOMICS

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answers *any three* questions.

1. (a) Why is Lewis model regarded as a classical model? Examine the development process as portrayed in the Lewis model. What are the shortcomings of Lewis model?

   (b) Briefly present the Harris-Todaro model and examine in what sense it is an improvement over the Lewis model. (4+10+6)+20=40

2. (a) What are the common characteristics of modern economic growth?

   (b) What is Human Development Index (HDI)? Discuss the procedure of construction of HDI. 20+20=40

3. Write short notes on:

   (a) Commercialisation of Indian agriculture and

   (b) Deindustrialisation in India during the colonial rule. 20+20=40

4. Discuss alternative measures of:

   (a) inequality and

   (b) poverty 20+20=40

5. (a) Discuss the salient features of the 'New' Industrial Policy that was adopted by India in 1991. In what ways did this policy differ from the 1956 Industrial Policy?

   (b) What were the major recommendations of the Chelliah Committee on tax reforms in India? (12+8)+20=40

Group-B

Answers *any two* questions.

6. (a) Discuss the major objectives of India's five-year plans.

   (b) Analyse the role of the public sector in the Indian economy. 20+20=40

7. Analyse the reforms that were initiated in India's banking sector, capital market and external sector since mid-1991. 40

8. (a) Analyse the structural changes that have taken place in West Bengal's economy since early 1990s.

   (b) Give a brief account of the major components of revenue and expenditure of the Government of West Bengal in recent years. 25+15=40

2023

ELECTRICAL ENGINEERING

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be written either in **English** or in **Bengali** but all answers must be in one and the same language.*

All symbols have their usual significance.

Answer *any five* questions.

1. (a) A two-phase load draws the following current:

$$I_1(t) = I_m \sin(\omega t - \phi_1),\ I_2(t) = I_m \cos(\omega t - \phi_2)$$

If these currents are balanced then find the value of ϕ_1.

(b) The three circuit elements shown in figure (Fig. 1) are part of an electric circuit. Calculate the total power absorbed by the three circuit elements in watts.

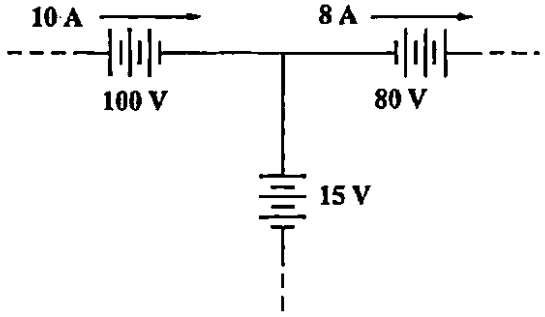


Fig. 1

(c) In the circuit shown in figure (Fig. 2), determine the value of the current I.

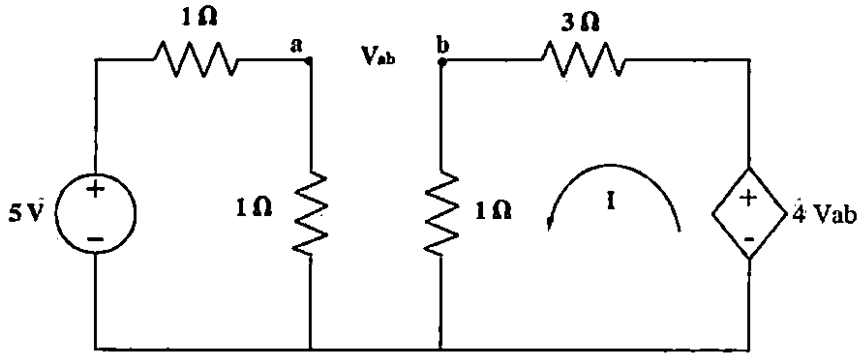


Fig. 2 10+10+20

2. (a) Find the driving point impedance Z(s) for the circuit shown below (in Fig. 3):

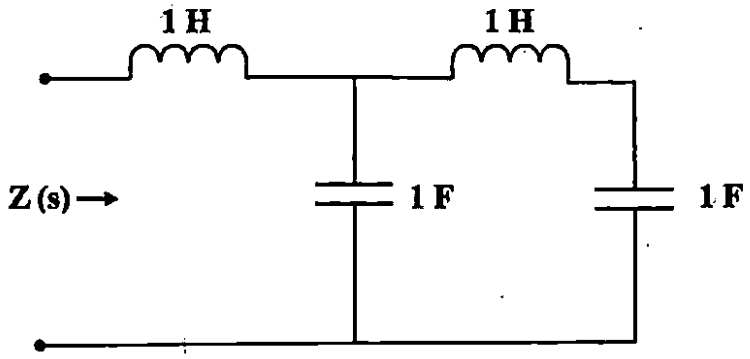


Fig. 3

(b) Two identical couple inductors are connected in series. The measured inductances for the two possible series connections are 380 μH and 240 μH. Calculate their mutual inductance in μH.

(c) A coil (which can be modelled as a series RL circuit) has been designed for high Q-performance at a rated voltage and a specified frequency. If the frequency of operation is doubled and the coil operated at the same rated voltage then the Q-factor and the active power P consumed by the coil will be affected as follows:

(i) P is doubled, Q is halved.

(ii) P is halved, Q is doubled.

(iii) P remains constant, Q is doubled.

(iv) P is decreased four times, Q is doubled.

Justify your answer in details. 10+10+20

3. (a) A single-phase load is connected between R and Y terminals of a 415 V, symmetrical, 3-phase, 4-wire system with phase sequence RYB. A wattmeter is connected in the system as shown in figure (Fig. 4). The power factor of the load is 0.8 lagging. What will be the reading of the wattmeter?

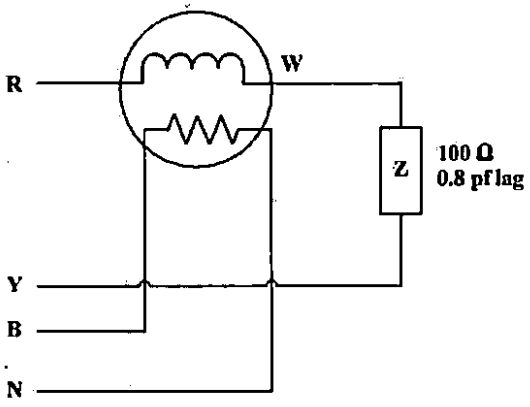


Fig. 4

(b) A water boiler at home is switched ON to the ac mains supplying power at 230 V, 50 Hz. Find the frequency of instantaneous power consumed by the boiler.

(c) A periodic voltage waveform observed on an oscilloscope across a load is shown in figure (Fig. 5). A permanent magnet moving coil (PMMC) meter is connected across the same load. Calculate the reading of the meter.

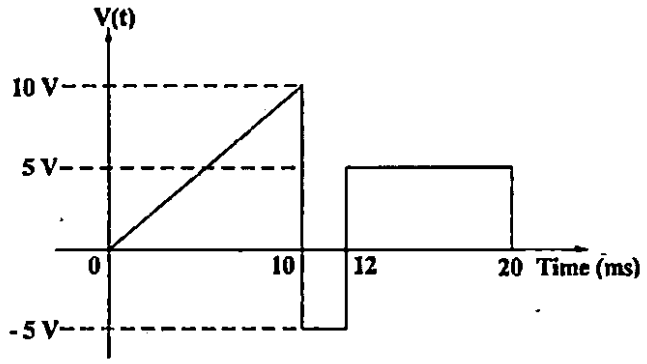


Fig. 5

10+10+20

4. (a) The transfer function of a system is given as

$$\frac{100}{s^2+20s+100}$$

Justify that the system is a critically damped system.

(b) Figure (Fig. 6) shows a feedback system where $K > 0$. Find the range of K for which the system is stable.

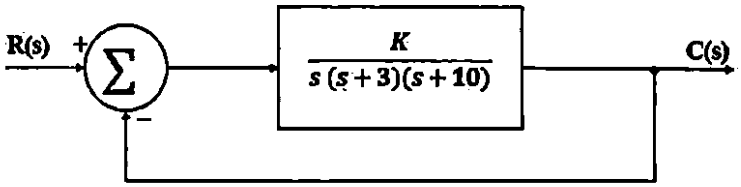


Fig. 6

(c) Consider the system described by following state space equations:

$$\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\end{bmatrix}=\begin{bmatrix}0 & 1\\ -1 & -1\end{bmatrix}\begin{bmatrix}x_1\\ x_2\end{bmatrix}+\begin{bmatrix}0\\ 1\end{bmatrix}u;\quad y=\begin{bmatrix}1 & 0\end{bmatrix}\begin{bmatrix}x_1\\ x_2\end{bmatrix}$$

If u is unit step input, then find the steady state error of the system. 10+10+20

5. (a) Let x and y be two vectors in three-dimensional space and $<x,y>$ denote their dot products. Then the determinant is

$$\det\begin{bmatrix}<x,x> & <x,y>\\ <y,x> & <y,y>\end{bmatrix}$$

(i) zero when x and y are linearly independent.

(ii) positive when x and y are linearly independent.

(iii) no-zero for all non-zero x and y.

(iv) zero only when either x or y is zero.

Justify your answer in details.

(b) $x(t)$ is a positive rectangular pulse from t = –1 to t = +1 with unit height as shown in figure (Fig. 7). Find the value of $\int_{-\infty}^{\infty} |X(\omega)|^2 d\omega$ {where $X(\omega)$ is the Fourier transform of $x(t)$}.

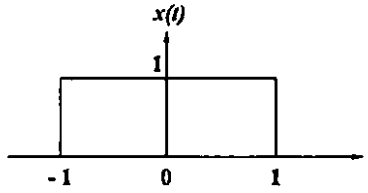


Fig. 7

(c) Calculate the rms value of the periodic waveform given in figure (Fig. 8).

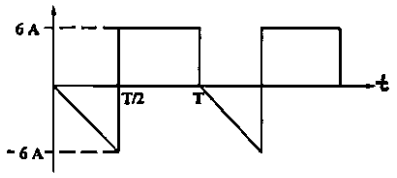


Fig. 8 10+10+20

6. (a) The second harmonic component of the periodic waveform is given in figure (Fig. 9). Calculate its amplitude.

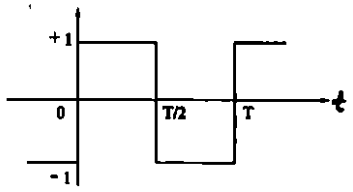


Fig. 9

(b) A three-phase, fully controlled thyristor bridge converter is used as line commutated inverter to feed 50 kW power at 420 V dc to a three-phase, 415 V (line), 50 Hz ac mains. Consider dc link current to be constant. Find the rms current of the thyristor.

(c) A single-phase fully controlled converter bridge is used for electrical braking of a separately excited dc motor. The dc motor load is represented by an equivalent circuit as shown in figure (Fig. 10).

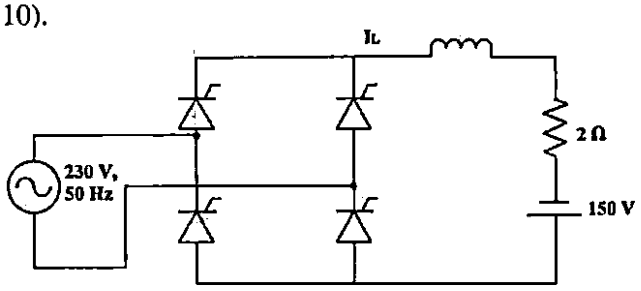


Fig. 10

Assume that the load inductance is sufficient to ensure continuous and ripple free load current. Find the firing angle of the bridge for a load current of $I_L = 10A$. 10+10+20

7. Write short notes on the following: 10×4=40
   (a) Nyquist's criterion
   (b) SMPS
   (c) Error in electro-dynamometer wattmeter
   (d) Brushless DC motor

2023

ELECTRICAL ENGINEERING

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and the same language.*

All symbols have their usual significance.

Answer *any five* questions.

1. (a) Derive the optimal division of load between two generators and extend the idea for n-number of generators in power system for economic operation.

   (b) The incremental cost curves in Rs/MWhr for two generators supplying a common load of 700 MW are shown in figure (Fig. 1). The maximum and minimum generation limits are also indicated. Find the optimum generation schedule.

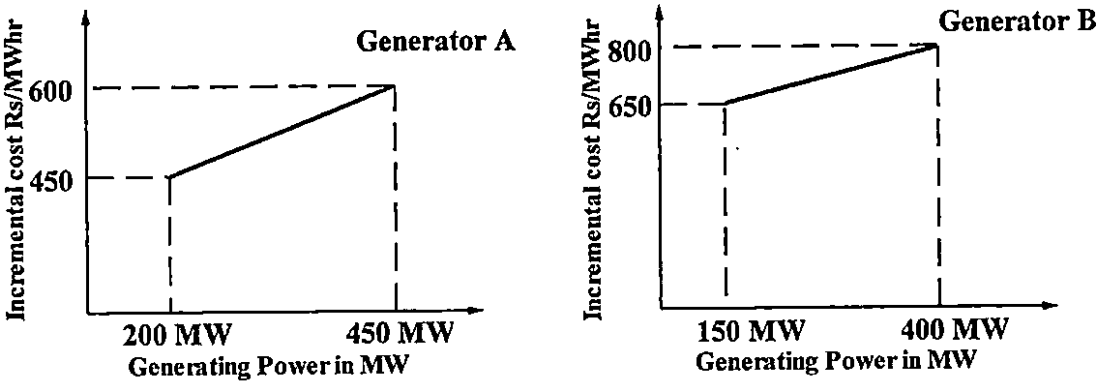


Fig. 1

   (c) The incremental cost characteristic of two generators delivering 200 MW are as follows:

$$\frac{dF_1}{dP_1} = 0{\cdot}10P_1 + 20$$

$$\frac{dF_2}{dP_2} = 0{\cdot}20P_{G_2} + 16$$

   For economic operation, find the values of power generations from both the generators P_1 and P_2. 10+10+20

2. (a) A lossless transmission line having surge impedance loading (SIL) of 2280 MW is provided with a uniformly distributed series capacitive compensation of 30%. Then, find the SIL of the compensated transmission line.

(b) An isolated 50 Hz synchronous generator is rated at 15 MW which is also the maximum continuous power limit of its prime mover. It is equipped with a speed governor with 5% droop. Initially, the generator is feeding three loads of 4 MW each at 50 Hz. One of these loads is programmed to trip permanently if the frequency falls below 48 Hz. If an additional load of 3·5 MW is connected then the frequency will settle down at which value?

(c) A round rotor generator with internal voltage $E_1 = 2{\cdot}0$ *pu* and $X = 1{\cdot}1$ *pu* are connected to a round rotor synchronous motor with internal voltage $E_2 = 1{\cdot}3$ *pu* and $X = 1{\cdot}2$ *pu*. The reactance of the line connecting the generator to the motor is 0·5 *pu*. When the generator supplies 0·5 *pu* power, find the rotor angle difference between the two machines. 10+10+20

3. (a) A generator with constant 1·0 *pu* terminal voltage supplies power through a step-up transformer of 0·12 *pu* reactance and a double circuit line to an infinite bus bar as shown in figure (Fig. 2). The infinite bus voltage is maintained at 1·0 *pu*. Neglecting the resistances and susceptances of the system, the steady state stability power limit of the system is 6·25 *pu*. If one of the double circuit is tripped, find the resulting steady state stability power limit in *pu*.

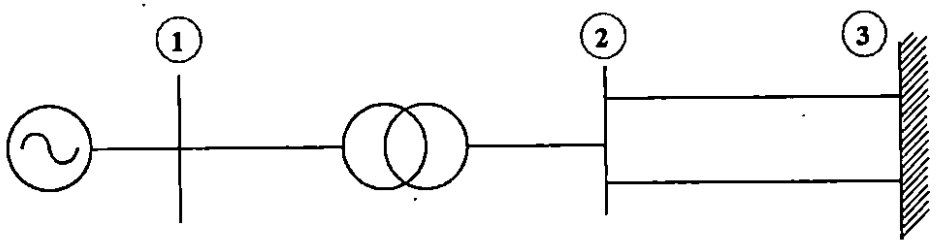


Fig. 2

(b) The *ABCD* parameters of a 3-phase overhead transmission line are $A = D = 0{\cdot}9\ \angle 0°$, $B = 200\ \angle 90°\ \Omega$ and $C = 0{\cdot}95 \times 10^{-3}\ \angle 90°\ S$. At no load condition and shunt inductive, reactor is connected at the receiving end of the line to limit the receiving-end voltage to equal to the sending-end voltage. Calculate the ohomic value of the reactor.

(c) A 20 MVA, 6·6 kV, 3-phase alternator is connected to a 3-phase transmission line. The per unit positive sequence and zero-sequence impedances of the alternator are $j\ 0{\cdot}1$, $j\ 0{\cdot}1$ and $j\ 0{\cdot}4$ respectively. The neutral of the alternator is connected to ground through and inductive reactor of $j\ 0{\cdot}05$ *pu*. The per unit positive, negative and zero-sequence impedances of the transmission line are $j\ 0{\cdot}1$, $j\ 0{\cdot}1$ and $j\ 0{\cdot}3$ respectively. All per unit values are based on the machine ratings. A solid ground fault occurs at one phase of the far end of the transmission line. Find the voltage of the alternator neutral with respect to ground during the fault.

10+10+20

4. (a) Explain the operation of single-phase induction motor by

(i) double revolving field theory and

(ii) cross-field theory.

(b) A 230 V, 50 Hz, 4-pole, single phase induction motor is rotating in the clockwise (forward) direction at a speed of 1425 rpm. If the rotor resistance at standstill is 7·8 Ω, then calculate the effective rotor resistance in the backward branch of the equivalent circuit. 25+15

5. (a) The armature resistance of a permanent magnet dc motor is 0·8 Ω. At no load, the motor draws 1·5 A from a supply voltage 25 V and runs at 1500 rpm. Calculate the efficiency of the motor while it is operating on load at 1500 rpm drawing a current of 3·5 A from the same source.

(b) A 50 kVA, 3300/230 V single phase transformer is connected as an auto-transformer shown in figure (Fig. 3), Find the nominal rating of the auto-transformer. 20+20

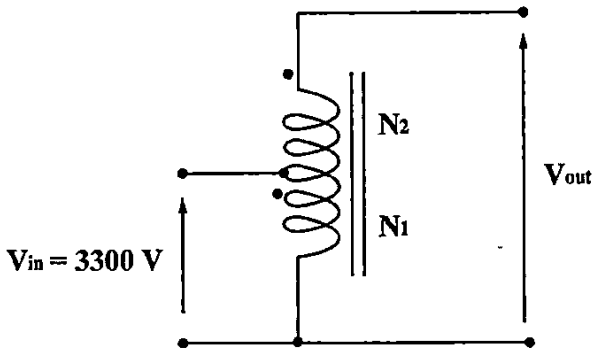


Fig. 3

6. (a) The following circuit (Fig. 4) has R = 10 kΩ, C = 10 μF. The input voltage is a sinusoidal at 50 Hz with an rms value of 10 V. Under ideal conditions, find the current I_S from the source.

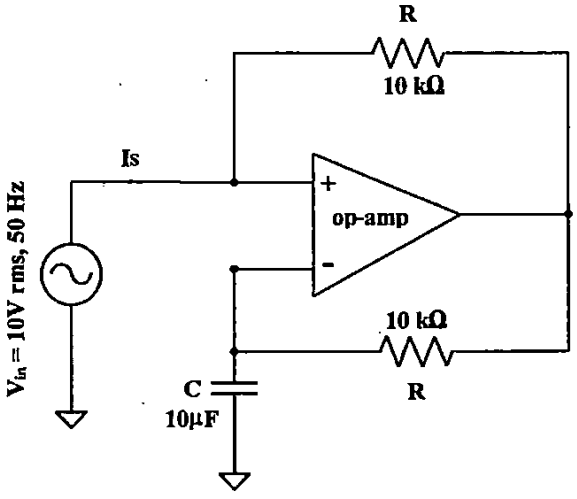


Fig. 4

(b) For the circuit of figure (Fig. 5) with an ideal operational amplifier, find the maximum phase shift of the output V_{out} with reference to the input V_{in}. 20+20

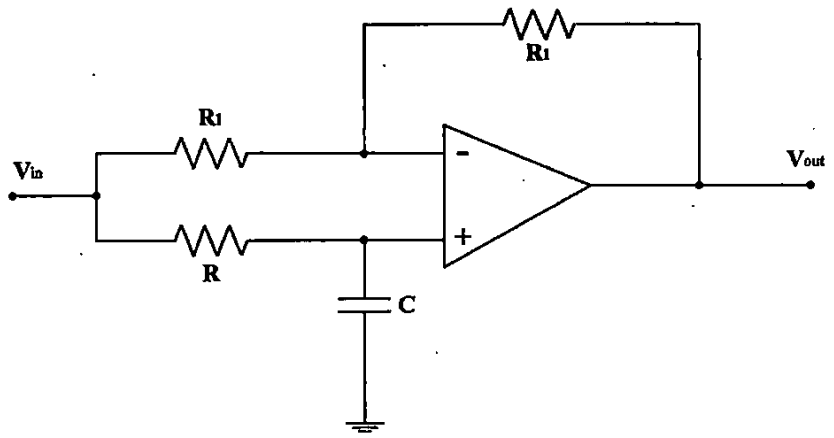


Fig. 5

7. (a) A 4-pole, 50 Hz, synchronous generator has 48 slots in which a double layer winding is housed. Each coil has 10 turns and is short pitched by an angle to 36° electrical. The fundamental flux per pole is 0·025 Wb. Find the line-to-line induced emf (in volts), for a three-phase star connection.

(b) The state variable description of a liner autonomous system is $\dot{X} = AX$, where $\dot{X}$ is the two-dimensional state vector and A is the system matrix given by $A = \begin{bmatrix} 0 & 2 \\ 2 & 0 \end{bmatrix}$. Find the roots of the characteristics equation. 20+20

8. Write short notes on the following: 10×4=40

(a) Application of Maximum Power Transfer Theorem

(b) Equal area criteria in power system stability analysis

(c) Lag-lead compensator

(d) Pitch factor and its advantages

2023
URDU
PAPER-I

Time Allowed : 3 Hours *Full Marks: 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to prescribed number shall be valued and the remaining ones ignored.
Answer should be written in ***Urdu****.*

Group: A

1. ہندآریائی زبان کی مختصر تاریخ بیان کیجئے۔ 30

یا

مسعود حسین خاں کی رائے کی روشنی میں مغربی ہندی اور اس کی مختلف بولیوں کا جائزہ لیجئے۔

2. دکن میں اردو زبان کے آغاز وارتقاء سے بحث کیجئے۔ 30

یا

''باغ و بہار'' کے حوالے سے میر امن کی نثری خدمات پر روشنی ڈالئے۔

Group: B

3. غالبؔ کی غزل گوئی کی انفرادی خصوصیات سے بحث کیجئے۔ 30

یا

فیض کی نظموں کے فنی اور جمالیاتی شعور سے اپنی واقفیت کا اظہار کیجئے۔

4. قصیدہ ''در تضحیک روزگار'' میں سوداؔ نے اپنے عہد کی سیاسی و سماجی زبوں حالی کو پیش کرتے ہوئے جس طنزیہ اسلوب کا سہارا لیا ہے اس کی ترجمانی کیجئے۔ 30

یا

اردو مرثیہ نگاری کی تاریخ میں مرزا دبیر کا مقام متعین کیجئے۔

5. کسی دو پر مختصر نوٹ لکھئے: 10×2=20

(الف) ''مسجد قرطبہ'' کا تنقیدی جائزہ

(ب) میر انیس کی رباعی گوئی

(ج) نظم ''تثلیث حیات''

6. دبستانِ دہلی کی شاعرانہ خصوصیات پر روشنی ڈالئے۔ 30

یا

سرسیّد تحریک سے اپنی واقفیت کا اظہار کیجئے۔

7. درج ذیل اشعار میں سے کسی تین کی ناقدانہ تشریح کیجئے۔ 5×3=15

(الف) شام سے کچھ بجھا سا رہتا ہے
دل ہوا ہے چراغ مفلس کا

(ب) عشق سے طبیعت نے زیست کا مزا پایا
درد کی دوا پائی ، دردلا دوا پایا

(ج) بوئے گل، نالۂ دل، دودِ چراغِ محفل
جو تری بزم سے نکلا سو پریشان نکلا

(د) تو ہے اور اک تغافل پیہم
میں ہوں اور انتظار بے انداز

8. درج ذیل رباعی کا مرکزی خیال واضح کیجئے . 15

اک فتنہ ہے ناقصوں میں کامل ہونا
اک قہر ہے وابستہ منزل ہونا
تاریخ کے اوراق جوالئے تو کھلا
اک جرم ہے احمقوں میں عاقل ہونا

2023
URDU
PAPER-II

Time Allowed : 3 Hours *Full Marks: 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to prescribed number shall be valued and the remaining ones ignored.

Answer should be written in Urdu.

Group: A

1. درج ذیل سوالات میں سے کسی چار کے جواب تحریر کیجئے۔ 30×4=120

(i) ''اردو نثر کی تاریخ میں داستان ''باغ و بہار'' ایک سنگِ میل کی حیثیت رکھتی ہے''

اس رائے سے آپ کو کہاں تک اتفاق ہے بحث کیجئے۔

(ii) آبِ حیات کے حوالے سے محمد حسین آزاد کی تذکرہ نگاری کے مختلف پہلوؤں کو واضح کیجئے۔

(iii) ''عودِ ہندی'' کے مکاتیب کی روشنی میں غالب کے اسلوبِ بیان پر روشنی ڈالئے۔

(iv) ''گئودان'' کی روشنی میں پریم چند کی ناول نگاری کا تنقیدی جائزہ پیش کیجئے۔

(v) راجندر سنگھ بیدی کی افسانہ نگاری پر بحث کرتے ہوئے افسانہ ''لاجونتی'' کے نفسیاتی پہلوؤں پر روشنی ڈالئے۔

(vi) ''ٹوبہ ٹیک سنگھ'' کے حوالے سے منٹو کی افسانہ نگاری کی انفرادی خصوصیت کو پیش کیجئے۔

(vii) ''گنجہائے گراں مایہ'' میں مختار احمد انصاری کا خاکہ رشید احمد صدیقی کی خاکہ نگاری کی بہترین مثال ہے۔

اس رائے پر بحث کیجئے۔

(viii) مقالہ ''خوشامد'' کی روشنی میں سرسیّد کی مقالہ نگاری کی ادبی افادیت کو اجاگر کیجئے۔

Group: B

2. درج ذیل سوالات میں سے کسی دو کے جواب تحریر کیجئے: 20×2=40

(i) ''مقدمہ شعروشاعری'' کی روشنی میں حالی کو بہ حیثیت تنقید نگار پیش کیجئے۔

(ii) ''ادب اور زندگی'' کے حوالے سے مجنوں گورکھپوری کا تنقیدی شعور واضح کیجئے۔

(iii) شمس الرحمٰن فاروقی نے ''تنقیدی افکار'' میں شعری جمالیات اور ادبی تحقیق وتنقید پر جس طرح سیر حاصل تبصرہ کیا ہے اس کا اجمالی جائزہ پیش کیجئے۔

(iv) ''تاثراتی تنقید'' فن تنقید کا ایک اعلیٰ نمونہ ہے۔ اس سے آپ کو کہاں تک اتفاق ہے بحث کیجئے۔

Group: C

3. درج ذیل عنوانات میں سے کسی ایک پر مضمون لکھئے: 40

(i) اردو افسانے میں سماجی مسائل کی عکاسی

(ii) پرویز شاہدی ایک عہد ساز فنکار

(iii) مولانا ابوالکلام آزاد کی مکتوب نگاری

(iv) مغربی بنگال کے اردو اخبارات

2023

HINDI

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

The figures in the margin indicate marks for each question.

Group-A

1. भाषा वैज्ञानिक दृष्टि से भाषा सामाजिक वस्तु है - यह स्पष्ट करते हुए युक्तिसंगत उत्तर दीजिए कि भाषा संप्रेषण का मौखिक साधन है और भौगोलिक रूप से स्थानीकृत होती है। 30

अथवा,

भाषा विज्ञान की परिभाषा बतलाते हुए उसके विभिन्न रूपों पर प्रकाश डालिए।

2. भाषा विज्ञान की दृष्टि से हिन्दी भाषा में नासिक्य स्वन की बहुलता हिन्दी परसर्ग और पदबंध संरचणा पर संक्षेप में प्रकाश डालिए। 30

अथवा,

परिनिष्ठित भाषा और अपभाषा, विशिष्ट भाषा तथा कूटभाषाके अंतर पर सोदाहरण प्रकाश डालिए।

Group-B

3. हिन्दी साहित्य के इतिहास लेखन की परम्परा का विवेचन कीजिए। 30

अथवा,

कृष्ण काव्यधारा की विशेषता बतलाते हुए सुरदास के वैशिष्ट्य का मूल्यांकन कीजिए।

4. रीतिसिद्ध काव्यधारा का अर्थ बतलाते हुए बिहारी की काव्यगत विशेषताओं पर प्रकाश डालिए। 30

अथवा,

हिन्दी गद्य के विकास में महावीर प्रसाद द्विवेदी के योगदान पर विचार व्यक्त कीजिए।

5. हिन्दी उपन्यास के विकास में रेणु के योगदान का मूल्यांकन अपने शब्दों में कीजिए। 30

अथवा,

हिन्दी आलोचना के विकास में रामविलास शर्मा की विशिष्टताओं का मूल्यांकन कीजिए।

6. निम्नलिखित में से किन्हीं *दो* प्रश्नों के उत्तर संक्षेप में लिखिए: 25×2=50

(क) चंद वरदाई

(ख) सहजो बाई

(ग) नाटककार मोहन राकेश

(घ) कृष्णा सोवती

(ङ) समकालीन कविता

2023

HINDI

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

The figures in the margin indicate marks for each question.

Group-A

(निम्नलिखित में से किन्हीं *तीन प्रश्नों* के उत्तर लिखिए।) 40×3=120

1. कबीर ने अपने ढंग से समाज के विचार और आधार को बदलने का प्रयास किया-पठित पदों के आधार पर प्रमाणित कीजिए।

2. सूरदास का सबसे मर्मस्पर्शी और वैदग्ध्यपूर्ण अंश भ्रमरगीत है — आचार्य रामचन्द्र के इस कथन को प्रमाणित कीजिए।

3. महादेवी वर्मा की विरह वेदना का वर्णन कीजिए।

4. नागार्जुन की कविताएँ सामाजिक पक्षधरता की कविताएँ हैं — इस कथन का युक्तियुक्त उत्तर दीजिए।

5. मोचीराम कविता धूमिल की काव्य संवेदना का प्रतिनिधित्व करती है — इस कथन को स्पष्ट कीजिए।

6. मुक्तिबोध की काव्यगत विशेषताओं का वर्णन कीजिए।

Group-B

(निम्नलिखित में से किन्हीं *दो प्रश्नों* के उत्तर लिखिए।) 40×2=80

7. 'क्रोध' निबंध की तात्विक समीक्षा कीजिए।

8. 'आषाढ़ का एक दिन' नाटक के आधार पर कालिदास का चरित्र-चित्रण कीजिए।

9. पठित कहानियों के आधार पर रेणु की कहानी कला की विशेषताएँ बतलाइए।

10. 'गंगामैया' उपन्यास में निरूपित समस्याओं पर प्रकाश डालिए।

2023

COMPUTER SCIENCE

Paper-I

Time Allowed- 3 Hours *Full Marks-200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given in English or in Bengali but all answers must be in one and same language.

Answer any FIVE questions

1. (a) Explain the differences between Depth-First Search (DFS) and Breadth-First Search (BFS) algorithms. Provide examples of specific scenarios or problems where each would be preferable. How do their time and space complexities compare in dense and sparse graphs? 4+3+3

(b) Discuss the A* algorithm for shortest path finding. What are its strengths and limitations? Give a detailed example of a situation where the algorithm is most effective. 4+3+3

(c) Analyze and compare the Quick Sort and Merge Sort algorithms in terms of their average and worst-case time complexities. Discuss how their performance is affected by different types of input data, such as nearly sorted, reverse sorted and random data. 6+4

(d) Compare and contrast binary search trees (BST) and balanced binary search trees. Discuss scenarios where using a balanced BST is preferable over a simple BST. 6+4

2.(a) Describe in detail the process of converting a decimal number to an octal number. Provide a step-by-step example of converting the decimal number 345 to its octal equivalent. 6+4

(b) Discuss the IEEE 754 standard for floating-point representation. Explain the components of a floating-point number (sign bit, exponent and mantissa) and how they are used to represent both very large and very small numbers. 5+5

(c) Explain the von Neumann architecture and its components. Compare and contrast different following: SIMD, MIMD and vector processing. 5+5

(d) Explain the Karnaugh Map (K-map) method. Design a digital circuit that implements the following Boolean function:

$$F(A, B, C) = (A + B).(\bar{B} + C)$$ 3+7

3. (a) Explain the importance of eigenvalues and eigenvectors in numerical analysis.

$$A = \begin{bmatrix} 2 & 3 & 6 \\ 0 & 4 & 4 \\ 2 & 0 & 4 \end{bmatrix}.$$

Is 2 an eigenvalue of A, and if so, find the dimension of its eigenspace. 3+7

(b) Explain significant digits and local truncation error with examples. An approximate value of π is given by 3.1428571 and its true value is 3.1415926. Find absolute and relative errors.

3+7

(c) Solve the linear system $Ax=b$ using Gaussian elimination with pivoting :

$$A = \begin{bmatrix} 6 & 2 & 2 \\ 6 & 2 & 1 \\ 1 & 2 & -1 \end{bmatrix} \text{ and } b = \begin{bmatrix} 0 \\ 5 \\ 0 \end{bmatrix}$$

10

(d) Discuss Euler's method to compute the numerical solution of a first order and first degree differential equation. Using Euler's method, find the solution of the differential equation

$$\frac{dy}{dx} = x^2 + y^2, \; y(0) = 0$$

In the range

$$0 \le x \le 0.5$$

taking $h=0.1$.

10

4. (a) What is a priority queue? Mention the disadvantages of linked lists. Write an algorithm to reverse a singly linked list. 1+3+6

(b) Explain operations of a stack with an example. Explain how an infix expression can be converted to a post fix expression with an example. 4+6

(c) What is a graph? Explain how graphs are represented. Explain how minimal spanning trees are constructed with an example. 1+3+6

(d) What is Binary Search Tree? Explain in brief how shortest path is calculated using Dijkstra's algorithm. 2+8

P.T.O.

5. (a) Compare AM and FM. Define modulation index and write down the expression for modulation index and total power in AM signal. 4+6

(b) Sketch the input and output characteristics of common emitter transistor configuration and explain briefly. Derive the relation between α and β for a transistor. For an npn transistor, α=0.995 and I_E=10m A. Find I_B and I_C? 5+5

(c) What are universal gates? Why they are called so? Draw and explain the functional block diagram of operational amplifier. 1+2+7

(d) What are the different types of optical fibre cables used in optical communication? Explain optical fibre communication system with block diagram. 4+6

6. (a) Discuss about 1's and 2's Complement of subtraction. Differentiate between binary code and BCD code. Convert $(5064)_9$ into base 5. 4+4+2

(b) Design XOR Gates using Universal Gates. Design Full subtractor by using Universal Gates. 5+5

(c) Explain shift registers. Design and implement 4-bit binary counter using D flipflop. 3+7

(d) Explain the differences among a truth table, state table, a characteristic table and an excitation table. A sequential circuit with 2 D Flip Flops A and B, two inputs X and Y and one output Z is specified by the following next state and output equations

$$A(t+1) = X'Y + XB$$
$$B(t+1) = X'A + XB$$
$$Z = A$$

i) Draw the logic diagram of the circuit

ii) List the state table for the sequential circuit. 4+6

7. (a) Explain Shannon channel capacity for a noisy channel. How Nyquist theorem applied for a noiseless channel? How many signal levels were needed to send 265 kbps over a noiseless channel with a bandwidth of 20 kHz? 4+3+3

(b) Compare packet switching and circuit switching. What the carrier frequency and the bit rate would be if they had an available bandwidth of 100 kHz spanning from 200 to 300 kHz and modulated their data using ASK with d = 1. 3+7

(c) What is hamming distance? In a CRC error detecting scheme, choose divisor polynomial P: $x^4 + x + 1$. Encode the bits 110101011. 3+7

(d) Explain the different types of noise that affect the performance of a communication system? Explain 2-dimensional parity check with an example. 5+5

8. Write short notes on the following topics (Any four) 10x4

(a) Pigeonhole principle

(b) CDMA process

(c) Gauss elimination method

(d) Internal and external sorting

(e) 4-bit binary counter

(f) RLC series circuit

2023

COMPUTER SCIENCE

PAPER-II

MWC(O)-COMP-II/23

Time Allowed – 3 Hours

Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English** or in **Bengali** but all answers must be In one and same language.

Answer any FIVE questions

1. (a) Explain in brief about deadlock prevention.
What is the need of Page replacement? Consider the following reference string
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1
Find the number of Page Faults with FIFO, Optimal Page replacement and LRU with four free frames which are empty initially. Which algorithm gives the minimum number of page faults?

(b) Explain the distinguishing features of i). Real time system ii) Multiprocessor system. What are the benefits of a VM? With a neat diagram, explain the working of a VM. 3+7

(c) What are semaphores? Discuss the two primitive semaphore operations. Explain solution to producer-consumer problem using Semaphores. 3+2+5

(d) Consider the following data with burst time given in milliseconds: 1+3+6

Process	Burst time	Priority
p1	10	3
p2	1	1
p3	2	3
p4	1	4
p5	5	2

The process has arrived in the order p1, p2, p3, p4, p5 all at time 0.
i. Draw Gantt charts for the execution of these processes using SJF, a nonpreemptive priority and RR (quantum=1) scheduling.
ii. What is the turnaround time and waiting time of each process for each of the scheduling algorithm.

2. (a) Distinguish between physical and abstract Systems. Discuss the primary characteristics of open systems. What are the considerations in deciding on a candidate system and why are they important? 6+4

2+3+5

P.T.O.

(b) Describe the concept and procedure used in constructing DFDs. Give an example. Discuss the procedure for constructing a questionnaire. Under what circumstances would an analyst depend more heavily on external rather than internal information, and why?

3+3+4

(c) List and illustrate the primary uses and elements of a decision table. Discuss various cost estimation techniques.

5+5

(d) What types of test data are used in system testing? Explain the differences between White-box and Black-box testing. Discuss the role of the Data Processing Auditor in system testing.

2+3+5

3. (a) What is frame buffer memory? Explain clipping. Write the Mid-Point sub division Algorithm for line Clipping.

1+2+7

(b) What is refresh rate? Write the properties of Bezier's curve. Rotate a triangle [(4,6),(2,4),(6,2)] about the vertex (4,6) by 1800 clockwise and find the new vertices.

1+3+6

(c) Explain the characteristics of a good line. What are the main categories of animation tools? Explain three basic rules for animation with example.

2+3+5

(d) State the difference between CMY and HSV color models. What do you mean by principle vanishing point? Briefly explain about parallel and perspective projections.

2+2+6

4. (a) What is static data class? Explain with an example. Write the concept of abstract classes and virtual base classes with a suitable example. Explain the concept of reusability in with an example.

3+3+4

(b) Define encapsulation. Explain with examples: overloading vs. overriding. Discuss the concept of generalization and aggregation.

1+4+5

(c) Describe memory allocation for objects. Compare and contrast error and exception. When do we need multiple catch blocks for a single try block? Give an example.

3+3+4

(d) Explain operator precedence. Differentiate between nested if-else and switch statement. Discuss the benefits of returning objects from functions.

3+3+4

5. (a) Design a 4-bit combination circuit decrementer using four full adder circuits.

A computer uses a memory unit with 256K words of 32 bits each. A binary instruction code is stored in one word of memory. The instruction has four parts: an indirect bit, an operation code, a register code part to specify one of 64 registers, and an address part.

(i) How many bits are there in the operation code, the register code part, and the address part?
(ii) Draw the Instruction word format and indicate the number of bits in each part.
(iii) How many bits are there in the data and address inputs of the memory?

4+6

Contd.....P-3

(b) Briefly describe the hardware organization of associative memory. Discuss the read and write operations for associative memory.

6+4

(c) Discuss the difference between tightly coupled and multiprocessors and loosely coupled multiprocessors from the view point of hardware organization and programming techniques. Using a shift register with parallel load, explain how to convert serial input data to parallel output data and parallel input data to serial input data. How many 128 x 8 memory chips are needed to provide a memory capacity of 4096 x 16?

4+4+2

(d) List different types of addressing modes. Explain any one with suitable diagrams and examples.

The content of the top of a memory stack is 5320. The content of the stack pointer SP is 3560. A two-word call subroutine instruction is located in memory at address 1120 followed by the address field of 6720 at location 1121. What are the content of PC, SP, and the top of the stack?

(i) Before the call instruction is fetched from memory?

(ii) After the call instruction is executed?

(iii) After the return from subroutine?

4+6

6. (a) Explain serial and non-serial schedules. Explain lock and unlock operations for binary locks.

5+5

(b) Explain the design guidelines of relational schemas. Why is BCNF stronger than 3NF? Explain with the help of an example.

5+5

(c) What are JOINs? Explain INNER JOIN and OUTER JOIN. Write an E-R diagram of an employee salary database and also mention the type of association between the entities.

1+3+6

(d) Explain the following: Multi-valued dependencies and fourth normal forms. Given a relation R(A, B, C, D, E) and Functional Dependency set FD = { A → B, B → E, C → D}, determine whether the given R is in 2NF? If not convert it into 2 NF.

5+5

7. (a) Write the steps to convert Non-Deterministic Finite Automata (NDFA) into Deterministic Finite Automata (DFA).

Let M=({q0,q1}, {0,1}, δ, q0, {q1}).

Contd...P- 4

Be NFA where $\delta(q0,0)=\{q0,q1\}$, $\delta(q1,1)=\{q1\}$

$\delta(q1, 0)=\varphi$, $\delta(q1, 1)=\{q0, q1\}$

Construct its equivalent DFA.

5+5

(b) Design the Analysis and Synthesis Model of Compiler. Construct Deterministic Finite Automata to accept the regular expression:

(0+1)* (00+11) (0+1)*

4+6

(c) Write the properties of LR parser with its structure. Show the following Grammar:

S-> AaAb|BbBa

A-> ϵ

B-> ϵ

Is LL(1) and parse the input string "ba".

4+6

(d) What are the problems associated with top-down parsing? Write the production rules to eliminate the left recursion and left factoring problems.

5+5

8. Write short notes on the following topics (Any four) 10x4

(a) Generic classes
(b) DMA controller
(c) Network data model
(d) Regular Expression
(e) Ring-type topology networks
(f) Memory mapped I/O

2023

ENGLISH

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Section-A

1. Write an essay on *any one* of the following: 40×1=40

   (a) Literature has a greater outreach since the advent of digitization.

   (b) Literature and reality shape each other.

   (c) WhatsApp is changing language.

Section-B

Answer *any two* of the following: 40×2=80

2. (a) Compare Lady Macbeth and Rosalind as dynamic female characters in *Macbeth* and *As You Like It*.

   Or,

   (b) What role do the Greek allusions play in *Edward II*?

   (c) What is the main theme of 'To His Coy Mistress'?

   (d) Why is 'Dejection' a 'quit without a pang'? Explain with reference to 'Dejection: an Ode'.

   (e) Examine 'The Last Ride Together' as a poem of consolation.

   (f) 'How Do I Love Thee' makes a statement about love, choice and freedom. Discuss.

   (g) How does Pope use the mockheroic genre to satirize society in the Rape of the Lock?

Section-C

3. Answer *any two* of the following questions: 40×2=80

   (a) What is Jane Austen's attitude to class in 'Pride and Prejudice'?

   (b) Write a critical analysis of the character of Michael Henchard in *The Mayor of CasterBridge*.

   (c) Discuss Huck as an archetypal hero.

   (d) How is social class shown to be significant in 'Wuthering Heights'?

   (e) Why isn't Frankenstein's monster given a name?

2023

ENGLISH

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Section-A

1. Attempt a critical appreciation of the following poem: 50

I met a traveller from an antique land
Who said : "Two vast and trunkless legs of stone
stand in the desert... Near them, on the sand,
Half sunk, a shattered visage lies, whose frown,
And wrinkled lip and sneer of cold command,
Tell that its sculptor well those passions read,
Which yet survive, stamped on these lifeless things.
The hand that mocked them and the heart that fed :
And on the pedestal these words appear :
'My name is Ozymandias, king of kings :
Look on my works, ye Mighty and despair!'
Nothing beside them remains, Round the decay
of that colossal work, boundless and bare
The lone and level sands stretch far away."

Section-B

2. Attempt *any one* of the following questions: 50

(a) Examine 'Easter 1916' as a political poem.

(b) Comment on 'The Love Song of J. Alfred Prufrock' as a document of literary modernism.

(c) The social validity of art or poetry is a major theme in 'In memory of WB Yeats'—Discuss.

(d) What aspects of motherhood are present in the poem 'Nick and the Candlestick'?

(e) Attempt a critical analysis of 'To India-My Native Land'.

3. Answer *any one* question from the following: 50

   (a) What is Jimmy's anger directed at in 'Look Back in Anger'?

   (b) What is the significance of the title of the play 'Waiting for Godot'?

   (c) What is the importance of Ireland in the novel '*Portrait of the Artist as a Young Man*'?

   (d) What points does Woolf make about women and writing in '*A Room of Ones Own*'?

4. Answer *any one* question from the following: 50

   (a) Examine the themes of discontentment and self-realization in *The Rainbow*.

   (b) Discuss the portrayal of women in *Kanthapura*.

   (c) Examine the title of the novel, *Things Fall Apart*.

   (d) What is the context of Tagore's speech '*Crisis in Civilization*'?

2023

GEOGRAPHY

PAPER-I

Time Allowed — 3 Hours. *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in ***English*** *or in* ***Bengali*** *but all answers must be in one and same language.*

Answer any five *questions, taking at least* two *from each group.*

[*Suitable illustrations in answers will be appreciated.*]

Group-A

1. Distinguish between weathering and mass wasting. Examine the factors and processes of mass wasting. State the postulates and principle of 'dynamic equilibrium'. 5+10+25=40

2. What is an airmass? Classify it stating your basis. Explain the processes of airmass modification with associated changes in weather conditions. Give the principles of Bjerken's theory of frontogenesis. 5+15+10+10=40

3. What are the factors influencing the origin of ocean currents? Account for the ocean currents in the Atlantic Ocean. How does the T-S diagrams help to identify a watermass? 15+15+10=40

4. Write brief notes on–ecotone, homeostasis, ecological niche, and ecological pyramids. What is a biogeochemical cycle? Briefly discuss the 'nitrogen cycle' with a diagram. (5×4)+5+15=40

5. Define and classify 'map projections' stating the basis. Explain the terms–principal and real scale, loxodrome and standard parallel, constant of a cone. What are thematic maps, and what are their different types? 10+(10×2)+10=40

Group-B

6. Account for the salient features of intensive subsistence farming in monsoon Asia. Critically discuss Von Thunen's model of agricultural landuse with present day relevance. 20+20=40

7. Examine the factors and measures of population growth. Discuss the patterns and trends of growth of the world population with annotated diagrams. 20+20=40

8. Write brief notes on–absolute and relative space, boundaries and frontiers, nation and state. Give a critical appraisal of 'Heartland Theory'. (8×3)+16=40

9. Distinguish between rural and urban settlements. Account for the types and patterns of rural settlements over the Upper, Middle and Lower Ganga plains. Critically discuss the model of urban growth after Burgess. 8+12+20=40

10. Discuss the concept and types of 'region'. Briefly write the principles and methods of 'regionalization'. Give the basis of the 'Growth Pole Theory' after Perroux. 10+20+10=40

2023

GEOGRAPHY

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer question 1 *and* any two *from the rest.*

[Suitable illustrations in answer will be appreciated.]

1. Divide India into tectonic divisions, and describe the structure and relief of the Peninsular Plateau. What are syntaxial bends? Briefly describe the Himalayan Drainage Reversal after Pilgrim (1918). (5+10)+5+20=40
2. What are the different forms of iron ore found in India? Give an account of its distribution, and trend of production. Elaborate on the role it played in determining the location of the iron and steel industry in India. 5+15+10=30
3. Give the nature and characteristics of Indian agriculture. What is the green revolution? In what ways did it transform the Indian economy? 10+5+15=30
4. Enumerate the locational dynamics, growth, and development of the sugar industry in India since independence. Give the problems and prospects of the aluminium industry in India. 20+10
5. Give the characteristics, patterns, factors, and processes of Indian urbanization. Account for the statewise distribution of crude sex ratio in India. 20+10=30

Group-B

(Answer *Question 6* and *any two* from the rest.)

(Suitable illustrations in answers will be appreciated.)

6. Divide West Bengal into physiographic divisions, and give the salient features of each. Write an account of the seasonal weather conditions experienced in West Bengal. 20+20=40
7. Give the location and geographic personality of West Bengal as a state. Write about the characteristics of the soils of the Rarh and Barind regions and relevance. 15+15=30
8. Examine the ecological conditions of growth, cultivation, production, problems, and prospects of rice in West Bengal. What are the impacts of the green revolution on rice cultivation in West Bengal? (5+5+5+5+5)+5=30
9. Describe the occurrences, mining, production, problems, and prospects of coal resources in West Bengal. Give the development and trend of non-conventional energy resources in this state. (5+5+5+5+5)+5=30
10. Discuss the trend of growth and pattern of distribution of population in West Bengal. Distinguish between the crude, physiological, and habitational density of the population in the state. 20+10=30

2023

GEOLOGY

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any three* questions.

1. a. Describe the layered structure of Earth with descriptions of chemical properties and physical properties in terms of density, temperature and pressure. 20

   b. What are the heat sources in the interior of the earth? Write short notes on each. Write a very brief account on earth's heat flow. What is geothermal gradient? Why does the geothermal gradient vary? What is negative geothermal gradient? 5+5+2+6+2=20

2. a. Define strain. Define longitudinal, volume and shear strain. Why and how the strain ellipsoid is conceived? Define 'lines of no finite strain' and 'plain strain'. What do the prolate and oblate strain ellipsoids indicate? Explain with necessary sketches and graphical representations. 2+6+4+4+4=20

   b. What is a shear zone? Define, with suitable sketches, left lateral and right lateral shear. Classify mylonites with a brief description of texture of each class. Describe with sketches two different indicators of sense of shear. 1+4+9+6=20

3. a. Define and describe with neat sketches: structure of passive continental margins and continental rifts. 10x2=20

   b. (i) Write the principle of radiometric age estimation of rocks. Write and explain the age equation. Why is Rb-Sr method used for determination of ages of old igneous and metamorphic rocks and also of Lunar rock samples? 8+6

   (ii) What are the reasons behind the separation of (A) Archaen and Proterozoic Eons, (B) Palaeozoic and Mesozoic Eras. 6

4. a. Write a note on evolution of Equidae. Describe with neat sketch(es) the hard part morphology of cephalopoda. 10+10=20

   b. Draw a vertical section of distribution of groundwater and give a geological description of it. Describe in brief two methods of groundwater recharge. 10+10=20

5. a. Describe, with labelled sketches, four different types of unconformities. 20

   b. Write notes on (i) Seismic zones of India, (ii) Cretaceous-Tertiary Boundary. 20

Group B

Answer any two questions

6. a. What are systematic joints and joint systems; define with explanatory sketches. Describe the features present on a joint surface. Draw joint superpositions / intersection patterns to show younger and older joints in an area with more than one joint set. 4+10+6=20

   b. Classify schistosity/rock cleavage. Draw sketches of each class. 20

7. a. Write in detail the engineering classification of intact rocks. Describe the geological investigations carried out before construction of a tunnel. 10+10=20

   b. Write in brief the history of formation of the Himalayan Mountain Belt since break-up of India from Gondwanaland to the present. 20

8. a. Write a detailed description of natural processes of preservation of plants and animals as fossils. 20

   b. Describe the lithostratigraphic succession and tectonic setting of the Bengal basin. 20

GEOLOGY

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any three* questions.

1. Answer any four questions

a) Define mineral and crystal? Are all mineral crystals? Justify your answer. What are the relations between lengths of crystallographic axes and angles between them in different crystal systems? 5+5=10

b) Describe morphology of any four types of intrusive igneous bodies. 2.5x4=10

c) What do you mean by CIPW norm? What are the bases of CIPW norm calculation? Describe in brief the use of norm. What are the disadvantages of CIPW norm? 1+3+4+2=10

d) What is a Tsunami? Describe, with a self-explanatory sketch, how does submarine faulting create a Tsunami? How does the character of Tsunami wave changes from ocean interior to the coast. 1+5+4=10

e) Describe, in brief, the processes of petroleum accumulation at structural traps. 10

2. a) Define (i) crystal form, (ii) crystal zone and (iii) crystal class with neat labelled sketches. Define 'Normal class' of crystal system. Describe, with a sketch, the general form of the normal class of Tetragonal system. Show, in a stereographic projection (hand-drawn, unmeasured projection), plots of the faces of this form and also the symmetry elements involved. 9+1+6+4=20

b) State and explain the Pauling's rules. Use sketches wherever necessary. 20

3. a) (i) Describe a typical facies association of barrier bar sediments. Explain how the facies members of this association indicates the geomorphological set up of the basin, nature of transporting agency(ies) and changes in energy conditions during deposition. 20

b) Define roundness and sphericity of clasts and sorting of clastic sediments. How do these help in interpretation of the maturity of the sediment? Write how the mineralogy of the clasts helps to interpret the nature of provenance. 3+7+10=20

4. a) Give a detailed account of Barrovian metamorphism of pelitic rocks in the Chlorite and Biotite zones. 20

   b) What are the physical and geological conditions of rock melting and formation of magma? Describe how magma from a single source is diversified to give different types of rock. 10+10=20

5. a) Write very brief accounts of mineral/ore present in the deposit, morphology and occurrence and origin of two important types of hydrothermal deposit. 20

   b) What are the bases of grading of coking and non-coking coals? How are coals classified in Indian Standard Classification? Write a short note on mode of occurrences of diamond deposits in India. 2+10+8=20

Group-B

Answer any two questions

6. a) What are different types of landslides? Give a geological description of each in brief. Write a note on measures practised for protection of hill-slopes and mitigation of landslide related hazards. 2+8+10=20

   b) How does mining activities pollute the soil and atmosphere? Describe the processes of industrial and nuclear waste disposal? 8+12=20

7. a) Draw a neat labelled representation of the Diopside (Di)-Anorthite (An) system. Describe the crystallisation behaviour of an initial melt of Composition $Di_{20}An_{80}$. Describe the petrogenetic significance of the system. 6+6+8=20

   b) What is metasomatism? Write a note on the roles of agents of metasomatism. What are the two main types of mantle metasomatism? Give one examples of each types? 2+10+6+2=20

8. a) Write notes on description of morphology and origin of four important types of fluvial landforms. 20

   b) Compare between alluvial fan and estuarine delta in terms of sediment type, sediment sequence, sedimentary structures and energy conditions of sedimentation. 20

AGRICULTURE

Paper I

Time Allowed – 3 Hours *Full Marks – 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** But all answers must be in one and the same language.*

Group A

Answer *any three* questions.

1. (a) Define the following with examples: (i) Crop sequence, (ii) Cropping intensity, (iii) Crop rotation, (iv) Paira cropping, and (v) Inter cropping. 3×5=15
   (b) Make three suitable crop sequences (at least 3 crops in a year) under West Bengal condition. 6
   (c) Why do you suggest to include leguminous crops in crop sequence? 5
   (d) Discuss on different agro-forestry system. Why social forestry is important in rural areas? 10+4=14

2. (a) Discuss on rice cultivation during *kharif* season in West Bengal with special reference to land preparation, sowing / planting, variety, nutrient management, weed control, harvesting and yield. 30
   (b) Why the yield of *boro* rice is higher than *kharif* rice? 5
   (c) Make a list of pulses and oilseeds with their growing seasons in West Bengal. 5

3. (a) Mention the role and deficiency symptoms of macro nutrients on plants. 10
   (b) Write short notes on bio-fertilizers (any two): 5×2=10
   (i) *Azolla*, (ii) *Azospirillum*, (iii) Phosphate solubilizing bacteria (PSB)
   (c) What do you suggest for reclamation of acid soil and saline soil? 8
   (d) Classify weeds with examples. Make a list of herbicides with dose, time of application and crops. 5+7=12

4. (a) Discuss on jute cultivation with special reference to sowing, variety, weeding, cropping system, harvesting, retting and yield. 20
   (b) Write a short note on grading of jute and its relation with minimum support price. 10
   (c) Discuss on mechanization in farming with special reference to powertiller, paddy transplanter, combine harvester and drone. What is custom hiring centre? 8+2=10

5. (a) Discuss on methods and systems of irrigation. Mention the criteria for scheduling irrigation. How water use efficiency can be improved in crop production system? 20+5+5=30
   (b) Differentiate between: 5×2=10
   (i) Dryland farming *vs.* Rainfed agriculture, and (ii) Green manure *vs.* Organic manure

Group B

Answer *any two* questions.

6. (a) Discuss on agro-climatic zones of West Bengal with reference to area, soil, climate and important crops. 20

   (b) Classify weather forecasting along with their importance in agriculture. Mention the role of print, electronic and social media in weather agro-advisory service. 10+10=20

7. (a) Discuss on the role and scope of information technology in Indian agriculture. 14
   (b) Mention the roles of public distribution system in food security. 12
   (c) Discuss on agro-processing and cold storage. 7+7=14

8. Write short notes on (any five): 8×5=40
   (a) SHG in agriculture
   (b) Remote sensing
   (c) Organic certification
   (d) Crop insurance
   (e) Forest products
   (f) Krishi Vigyan Kendras (KVKs) in West Bengal
   (g) Soil formation
   (h) Marketing intelligence

2023

AGRICULTURE

Paper II

Time Allowed – 3 Hours *Full Marks – 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** But all answers must be in one and the same language.*

Group A

Answer *any three* questions.

1. (a) Classify seeds. Narrate the steps of seed certification. 5+10=15
   (b) Discuss on seed production of hybrid rice or hybrid maize. 15
   (c) Write a short note on seed quality testing. 10

2. (a) Describe briefly the cultivation practices of mango with special reference to variety, planting, intercultural operation, nutrient and pest management, harvesting and yield. What do you mean by geographical indication (GI) of mango of West Bengal? 25
   (b) Discuss on protected cultivation of horticultural crops. 15

3. (a) Narrate the steps of synthesis of ATP during photophosphorylation. Diagrammatically represent C3 pathway of photosynthesis. Compare among the pathways of C3, C4 and CAM. 8+6+6=20
   (b) Write down the mechanism of opening and closing of stomata. 8
   (c) Make a list of two pests and two diseases for one important fruit, vegetable, flower along with their control measures. 4×3=12

4. (a) What do you mean by photoperiodism? Mention the effects of photoperiods on growth and development of plants. 10
   (b) Describe the physiological roles of gibberellins, cytokinins and abscissic acid in plants. 15
   (c) Discuss on salinity and drought stress with reference to symptoms of plants and mitigation options. 15

5. (a) Mention the importance of pure-line selection in plant breeding. 10
   (b) Highlight main features of mutation breeding. Differentiate between traditional breeding and ideotype breeding. 10+5=15
   (c) Discuss on different types of molecular markers used in crop research with their advantages. 15

Group B

Answer *any two* questions.

6. (a) What do you mean by plant genetic resources (PGR)? What methods do you suggest for conservation of PGR? Mention the role of Protection of Plant Varieties and Farmers' Authority (PPV&FRA). 5+10+5=20

   (b) How can you relate the importance of plant genetic resources in climate change situation. Discuss briefly on genetically modified (GM) crops along with their scope of cultivation in India. 10+10=20

7. (a) Explain Mendel's law of inheritance. 10

   (b) Mention different reproductive features that facilitate cross-pollination and self-pollination in plants. 15

   (c) Discuss on seed production of any one cross-pollinated oilseed or vegetable crop. 15

8. Write short notes on (any five): 8×5=40
   (a) Landscaping
   (b) Integrated Pest Management (IPM)
   (c) Male sterility and its use in crop improvement
   (d) Polyploids in agriculture
   (e) Meiotic cell division
   (f) Medicinal plants in West Bengal
   (g) Backcross breeding
   (h) Scope of export of agricultural products from West Bengal

2023

Santali

PAPER-I

MWC(O)-SANT-I/23

Time Allowed – 3 Hours

Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given in the Santali language and 'Ol Chiki' Script.

Section-A

1. ᱱᱚᱰᱚ ᱵᱦᱵᱨᱟ ᱚᱨᱮᱱᱜ ᱚᱞᱪᱤᱱ ᱮᱢᱩᱫ (Answer all the questions) 10X5=50

ᱤ) ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱩᱱᱤ.ᱚᱮᱨ ᱚᱨᱮᱱᱜ ᱜᱩᱞᱮᱱᱜᱩᱞᱮ ᱢᱚ ᱮᱢᱩᱫ ।

ᱡᱤ) ᱣᱟᱥᱱᱚᱱᱚᱞ ᱯᱟᱨᱮᱥᱩ ᱚᱨ ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱩᱱᱤ.ᱚᱮᱨ ᱚᱨᱮᱱᱜ ᱦᱚᱮᱱ.ᱭ ᱚᱨ 'ᱮᱢᱯᱟᱨᱦᱟ' ᱚᱨᱮᱱᱜ ᱨᱮᱭ ᱥᱜᱩᱱ ᱥᱮᱨᱫᱟ ᱱᱤᱢᱚᱱᱮᱱ ᱚᱠᱚᱱᱚ ? ᱮᱢ ᱩᱱᱟᱱᱚᱱ.ᱭ ᱩᱱ ।

ᱜᱤ) ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱚᱰᱮᱰᱟ ᱯᱮᱦᱱᱚᱲ ᱜᱮᱱᱚᱱᱚ ᱚᱨᱮᱱᱜ ᱡᱟᱱ.ᱱᱟᱲ ᱢᱚ ᱯᱟᱱ.ᱨᱮᱦᱱ. ᱮᱢᱯᱟᱨᱮ ᱮᱢᱩᱫ । 'ᱡᱟᱱ.ᱮ' ᱯᱮᱦᱱᱚᱲ 'ᱱ.ᱯᱟᱲ/ᱱ.ᱡᱟᱮ' ᱚᱨᱮᱱᱜ ᱡᱮᱭᱡᱟᱱᱚ ᱣᱚᱥᱱᱚᱱᱚ ᱚᱠᱚᱱᱚ ᱢᱮᱴ ᱡᱚᱱᱜ ? ᱮᱢ ᱩᱱᱟᱱᱚᱱ.ᱭ ᱩᱱ ।

ᱣᱤ) ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱩᱱᱤ.ᱚᱮᱨ ᱚᱨ 'ᱮᱢᱟᱱ' ᱡᱮᱭᱡᱟᱱᱚ ᱚᱨᱮᱱᱜ ᱩᱨᱩᱭᱚ ᱮᱢᱩᱫ ।

ᱯᱤ) ᱩᱱᱤ.ᱚᱮᱨ ᱮᱢᱢᱟᱮᱨ' ᱚᱨᱮᱱᱜ ᱡᱟᱱ.ᱱᱟᱲ ᱯᱮᱦᱱᱚᱲ ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱚᱨᱮᱱᱜ ᱱᱟᱹᱰᱟᱹᱭ ᱮᱢ ᱩᱱᱟᱱᱚᱱ.ᱭ ᱩᱱ ।

2. ᱱᱟᱣᱟᱱ' ᱜᱮ ᱣᱟᱥᱱᱚᱱᱚ ᱵᱦᱵᱨᱟ ᱚᱨᱮᱱᱜ ᱚᱞᱪᱤᱱ ᱮᱢᱩᱫ (Answer any two questions) : 25X2=50

ᱤ) ᱮᱱᱟᱣᱱᱚ ᱣᱟᱥᱱᱚᱱᱚᱠᱚᱨᱮᱜᱚ ᱩᱱᱤ.ᱚᱮᱨ ᱯᱮᱦᱱᱚᱲ ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱩᱱᱤ.ᱚᱮᱨ ᱮᱜᱤᱣᱤᱨᱭᱟᱱᱚᱜ ᱚᱨ ᱮᱨᱯᱮᱨᱮ ᱣᱟᱹᱨᱤ ᱯᱮᱦᱱᱚᱲ ᱩᱱᱤ.ᱚᱮᱨ ᱚᱨᱮᱱᱜ ᱱᱟᱹᱰᱟᱹᱭ ᱮᱢᱯᱟᱨᱮ ᱵᱚᱞᱚᱱ.ᱭ ᱣᱚᱨᱚ ᱜᱟᱱᱤᱨᱮᱱᱜ-ᱱᱟ ᱡᱟᱱᱚᱠᱚᱲᱚᱱ ᱱᱩᱭᱩᱢ ᱡᱟᱱᱚᱨᱮᱱ ? ᱮᱢ ᱩᱱᱟᱱᱚᱱ.ᱭ ᱩᱱ ।

ᱡᱤ) ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱣᱟᱨᱮᱱᱟᱯᱟ ᱡᱚ ᱮᱢᱚᱜ ᱩᱱᱚᱣᱟᱨᱮ ᱮᱱᱟᱩᱱᱚᱨᱮ ᱡᱚ ᱥᱟᱱᱟᱢᱟᱭ ᱣᱮᱛᱤ ᱯᱟᱱ.ᱜᱤᱨᱮ ᱥᱮᱛ ᱥᱮᱛ ᱩᱱᱤᱱᱮᱜᱚᱱᱛᱟᱨ ᱣᱟᱨᱮᱱᱟᱯᱟ ᱣᱟᱨᱤᱱᱟᱢᱚᱱ ᱱᱚᱰᱚ ᱯᱟᱱ.ᱵᱚᱨ ᱡᱟᱱᱚᱨᱮᱱᱜ ᱢᱚᱵᱚᱱᱮᱢ ᱡᱟᱱᱚᱠᱚᱲᱚᱱ ᱱᱩᱭᱩᱢ ᱡᱟᱱᱚᱨᱮᱱ ? ᱮᱢ ᱩᱱᱟᱱᱚᱱ.ᱭ ᱩᱱ ।

ᱜᱤ) ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱩᱱᱤ.ᱚᱮᱨ ᱮᱢᱚᱭ ᱵᱚᱦᱚ ᱵᱚᱦᱚ ᱩᱱᱤ.ᱚᱮᱨ ᱚᱨᱮᱱᱜ ᱮᱵᱩᱵᱩᱵ ᱮᱱ.ᱜᱮ.ᱨ ᱡᱟᱱᱚᱠᱚᱲᱚᱱ-ᱱᱟ ? ᱮᱢ ᱩᱱᱟᱱᱚᱱ.ᱭ ᱩᱱ ।

ᱞᱤ) ᱱ.ᱵᱱ. ᱚᱨᱮᱱᱜ ᱩᱱᱤ.ᱚᱮᱨ ᱜᱩ ᱵᱚᱦᱚ ᱢᱚ ᱡᱟᱱᱚᱠᱚᱲᱚᱱ-ᱱᱟ ? ᱮᱢ ᱩᱱᱟᱱᱚᱱ.ᱭ ᱩᱱ ।

Section-B

3. ᱱᱚᱰᱚ ᱵᱦᱵᱨᱟ ᱚᱨᱮᱱᱜ ᱚᱞᱪᱤᱱ ᱮᱢᱩᱫ (Answer all the questions) 10X5=50

ᱤ) ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱮᱱᱚᱭᱟᱨᱜ ᱚᱨᱮᱱᱜ ᱱᱤᱭᱩᱛᱤ ᱚᱨ ᱢᱚᱱᱟ ᱮᱱᱟᱣᱚᱜᱚᱱ ᱩᱱᱚᱞᱮᱱᱜᱜᱚ ᱢᱟᱞᱮᱵᱵ ᱱᱤᱜ ᱥᱮᱨᱫᱟ ᱮᱢᱩᱫ ।

ᱡᱤ) 'ᱩᱱᱚᱜᱟ ᱢᱚᱜᱚᱮ ᱜᱩ ᱜᱚᱢᱚᱢ ᱜᱮ ᱮᱱᱚᱨᱮᱱ' – ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱮᱱᱚᱭᱟᱨᱜ ᱱᱤᱜᱚᱱᱚ ᱡᱚ ᱣᱟᱱᱩᱩᱨᱟᱱᱩ ᱢᱚᱜᱚᱱᱚ ᱮᱜᱚᱱ ᱢᱟᱱᱤᱜᱚᱱᱚ ᱮᱜᱮ ᱮᱨᱤᱥᱤᱭ ᱩᱱ ।

ᱜᱤ) ᱜᱮ ᱱᱚᱴ ᱮᱢᱚᱱᱤᱜᱚᱱᱚᱜᱚ ᱚᱨᱮᱱᱜ ᱮᱱᱮᱜᱚᱱᱛᱟᱨ ᱮᱜᱮᱜᱟᱣᱮ ᱚᱨᱮᱱᱜ ᱣᱟᱱᱚᱜᱚ ᱢᱟᱱᱤᱜᱚᱱᱚ ᱮᱢ ᱮᱜᱚᱜᱚᱱ ᱩᱱ ।

ᱝᱤ) ᱩᱱᱮᱛᱤᱱᱟᱣ ᱣᱚᱜᱟᱣᱵᱮᱱᱤᱡᱟᱱᱚᱜ ᱩᱵᱣᱩᱵ ᱱᱚᱰᱚ ᱮᱱ.ᱣᱮᱱ.ᱮ ᱣᱟᱱᱚᱜᱚ ᱢᱟᱱᱤᱜᱚᱱᱚ ᱮᱢ ᱮᱜᱚᱜᱚᱱ ᱩᱱ ।

b) ᴚᴣᴄᴑᴣᴝᴧ ᴚᴣᴕᴡᴤᴥ ᴤᴤ ᴡᴣᴗᴕᴤ ᴚᴣᴡᴕ 'ᴚᴕᴗᴧᴤ' ᴣᴓ ᴤᴤᴤᴗ ᴣᴘᴗᴤ ।

4. ᴅᴣᴡᴣ' ᴓᴤ ᴡᴣᴤᴓᴣ ᴕᴕᴕᴅᴧ ᴤᴤᴓᴣᴓ ᴑᴤᴅᴣ ᴣᴘᴗᴤ (Answer any two questions):, 25X2=50

a) ᴚᴣᴄᴑᴣᴝᴧ ᴓᴣᴗᴣᴗ ᴚᴣᴕᴡᴤᴥ ᴤᴤᴓᴣᴓ ᴅᴣᴡᴣᴄᴑᴧ ᴡᴣᴡᴣᴑ ᴗᴧᴥᴅᴣᴣ ᴣᴄᴣᴘ ᴣᴘᴗᴤ ।

c) ᴚᴣᴄᴑᴣᴣᴣᴓ ᴅᴣ.ᴑᴧᴓᴣ.ᴤᴧ ᴕᴕᴤᴕᴗ ᴚᴣᴡ ᴤᴣᴕᴣᴡ ᴤᴤ ᴚᴣ.ᴥᴤᴕ ᴤᴣᴗᴕᴣ.ᴥᴤ ᴗᴕᴤᴗᴕ ᴣᴓ ᴤᴤᴤᴗ ᴣᴘᴗᴤ ।

d) ᴓᴣᴓᴣᴄ ᴚᴣᴕᴡᴤᴥ ᴤᴤ ᴡᴣᴥᴣᴘ ᴡᴤᴗᴡᴤᴣᴗ ᴣᴓ ᴤᴤᴤᴗ ᴣᴘᴗᴤ ।

e) ᴄᴣᴡᴣᴓ ᴚᴣᴄᴑᴣᴝᴧ ᴚᴣᴕᴡᴤᴥ ᴡᴣᴡᴣᴑ ᴗᴧᴥᴅᴣᴣ ᴣᴄᴣᴘ ᴣᴘᴗᴤ ।

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2023 MWC(O)-SANT-II/23

Santali

PAPER-II

Time Allowed – 3 Hours Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given in the Santali language and 'Ol Chiki' Script

Section-A

1. ᱱᱚᱰᱚ ᱵᱟᱹᱞᱛᱤ ᱯᱟᱨᱤᱥᱚᱱ ᱚᱞᱯᱚ ᱠᱟᱱᱟ (Answer all the questions) 10X5=50

ᱟ) ᱜᱚᱲᱚ ᱵᱚᱫᱚᱞᱮ ᱢᱟᱱᱩᱥᱟᱹᱨᱤᱛᱮ ᱵᱟ ᱯᱟᱨᱤᱥᱚᱱ ᱵᱟᱦᱚᱱᱟ ᱩᱞᱚᱜᱤ ᱯᱮᱞᱟᱱᱚᱨ ᱥᱮᱨᱟᱱᱮ ᱵᱚᱫᱚᱞᱟ ᱠᱟᱱᱟ ᱥᱮᱨᱟᱱᱮ ᱵᱚᱞᱤᱜᱤ ᱢᱟᱱᱩᱥᱟᱹᱨᱤᱛᱮ ᱵᱟᱦᱚᱱᱟ ᱠᱚᱢᱛᱤ ᱞᱮᱠᱷᱟᱱᱟ ᱩᱪᱟᱹᱨᱚᱜᱟᱱ ᱯᱟᱨᱤᱥᱚᱱ ᱚᱞᱯᱚ ᱠᱟᱱᱟ ।

ᱠ) ᱮᱞᱮᱠᱴᱨᱚᱱᱤᱠ ᱢᱤᱰᱤᱭᱟ ᱵᱤᱱᱟ ᱥᱟᱦᱟᱭᱚᱜ ᱱᱚᱰᱚ ᱠᱚᱢᱯᱤᱣᱩᱴᱟᱨ ᱯᱟᱨᱤᱥᱚᱱ ᱚᱞᱯᱚ ᱠᱟᱱᱟ ।

ᱜ) 'ᱥᱚᱱᱟ ᱚᱠᱥᱤᱡᱮᱱ ᱣᱮᱫᱟᱨᱤᱭᱟᱹ ᱯᱮᱨᱤᱭᱚᱰᱤᱠ ᱴᱮᱵᱩᱞ' – ᱢᱩᱱᱰᱟ ᱩᱪᱟᱹᱨᱚᱜᱟᱱ ᱚᱞᱚᱱᱚ ᱵᱟᱦᱚᱱᱟ ᱱᱚᱰᱚ ᱥᱮᱨᱟᱱᱮ ᱣᱮᱵᱥᱟᱭᱴ ᱯᱟᱨᱤᱥᱚᱱ ᱚᱞᱯᱚ ᱠᱟᱱᱟ ।

ᱝ) ᱵᱟᱦᱚᱱᱟᱜᱚᱱ ᱣᱮᱫᱟᱨᱤᱭᱟ ᱯᱟᱹᱨᱥᱮᱱᱟᱜᱚ ᱩᱞᱚᱜᱤ ᱯᱮᱞᱟᱱᱚᱨ ᱥᱮᱨᱟᱱᱮ ᱚᱞᱚᱱᱚ ᱵᱟᱦᱚᱱᱟ ᱩᱪᱟᱹᱨᱚᱜᱟᱱ ᱣᱮᱵᱥᱟᱭᱴ ᱯᱟᱨᱤᱥᱚᱱ ᱚᱞᱯᱚ ᱠᱟᱱᱟ ।

ᱞ) ᱮᱱ.ᱯᱤ.ᱤ ᱵᱟᱦᱚᱱᱟᱜᱚᱱ ᱣᱮᱫᱟᱨᱤᱭᱟ ᱯᱟᱹᱨᱥᱮᱱᱟᱜᱚ ᱩᱞᱚᱜᱤ ᱯᱮᱞᱟᱱᱚᱨ ᱥᱮᱨᱟᱱᱮ ᱚᱞᱚᱱᱚ ᱵᱟᱦᱚᱱᱟ ᱠᱟᱱᱟ ।

2. ᱢᱟᱦᱟᱱ᱾ ᱜᱮ ᱣᱟᱱᱵᱮᱨᱮᱱ ᱵᱟᱹᱞᱛᱤ ᱯᱟᱨᱤᱥᱚᱱ ᱚᱞᱯᱚ ᱠᱟᱱᱟ (Answer any two questions) : 25X2=50

ᱟ) ᱵᱟᱦᱚᱱᱟᱜᱚᱱ ᱣᱮᱫᱟᱨᱤᱭᱟ ᱯᱟᱹᱨᱥᱮᱱᱟᱜᱚ ᱩᱞᱚᱜᱤ ᱯᱮᱞᱟᱱᱚᱨ ᱵᱟ.ᱵᱩᱞ ᱯᱟᱹᱨᱥᱮᱱᱟᱜᱚ ᱵᱟᱹᱞᱛᱤ ᱣᱮᱵᱥᱟᱭᱴ ᱵᱟᱦᱚᱱᱟ ᱮᱢᱯᱞᱚᱭᱢᱮᱱᱴ ᱚᱞᱯᱚ ᱠᱟᱱᱟ ।

ᱠ) ᱮᱞᱮᱠᱴᱨᱚᱱᱤᱠ ᱩᱥᱮᱞ'ᱥ ᱜᱮᱱᱮᱨᱮᱥᱤᱱ ᱚᱯᱴᱤᱢᱟᱭᱡᱮᱥᱱ ᱮᱱᱡᱤᱱᱤᱭᱟᱨᱤᱝ ᱯᱟᱨᱤᱥᱚᱱ ᱵᱟᱹᱞᱛᱤ ᱯᱟᱨᱥᱮᱱᱟᱜᱚ ᱮᱱ.ᱯᱤ.ᱤ ᱵᱟᱦᱚᱱᱟ ᱠᱟᱱᱟ ? ᱚᱞᱯᱚ ᱠᱟᱱᱟ ।

ᱚᱨᱮᱵᱟᱦᱟᱱᱮ/OR

ᱜ) ᱚᱨᱮᱜᱟᱱ ᱩᱱᱟᱹᱣᱟᱹᱱ ᱚᱨᱮᱚᱨᱚ ᱨᱮ ᱩᱪᱟᱹᱨᱚᱜᱟᱱ ᱮᱢ.ᱣᱟᱭ ᱢᱟᱯ ᱠᱟᱱᱟ ।

ᱝ) ᱢᱟᱦᱟᱱᱚᱨᱟᱡᱟᱹᱱ (ᱢᱟᱦᱟᱱ ᱨᱟᱡᱟᱹᱱᱮ) ᱵᱤᱫᱤᱭᱟᱜᱤᱛ ᱥᱮᱨᱟᱱᱮ ᱚᱞᱯᱚ ᱵᱟᱦᱚᱱᱟ ᱠᱟᱱᱟ ।

Section-B

3. ᱱᱚᱰᱚ ᱵᱟᱹᱞᱛᱤ ᱯᱟᱨᱤᱥᱚᱱ ᱚᱞᱯᱚ ᱠᱟᱱᱟ (Answer all the questions) 10X5=50

ᱟ) ᱮᱱᱮᱚᱢᱮᱴᱨᱤᱠ ᱚᱵᱡᱮᱠ.ᱵᱟᱹᱞᱤᱭᱟᱹᱨ ᱮᱱᱟᱞᱤᱥᱤᱥ ᱢᱟᱱᱩᱥᱟᱹᱨᱤᱛᱮ ᱜᱮᱣᱟᱹᱨᱚᱱᱚ ᱩᱞᱚᱜᱤ ᱯᱮᱞᱟᱱᱚᱨ ᱥᱮᱨᱟᱱᱮ ᱚᱞᱚᱱᱚ ᱢᱮᱱᱟᱢᱟᱹᱨᱤ ᱚᱞᱯᱚ ᱠᱟᱱᱟ ।

ᱠ) ᱜᱚᱲᱚ ᱵᱚᱫᱚᱞᱮ ᱮᱢ.ᱵᱤ.ᱮ ᱯᱟᱨᱤᱥᱚᱱ ᱵᱟᱦᱚᱱᱟ ᱠᱚᱢᱯᱤᱣᱩᱴᱟᱨ ᱢᱟᱱᱩᱥᱟᱹᱨᱤᱛᱮ ᱵᱟᱦᱚᱱᱟ ᱠᱟᱱᱟ ।

ᱜ) ᱢᱟᱨᱣᱟ ᱢᱟᱨᱣᱟᱰᱤ ᱚᱨ ᱚᱯᱚᱨ ᱱᱚᱰᱚ ᱯᱷᱮᱥᱵᱩᱠ ᱩᱪᱟᱹᱨᱚᱜᱟᱱ ᱚᱞᱚᱱᱚ ᱵᱟᱦᱚᱱᱟ ᱠᱟᱱᱟ ।

ᱝ) ᱱᱟᱹᱫᱮᱣᱟᱹᱞᱟ ᱮᱱᱟᱞᱤᱥᱤᱥ ᱢᱟᱱᱮ 'ᱢᱟᱦᱟᱯᱩᱨᱩᱱᱤ, ᱮᱞ.ᱯᱤᱱᱟᱢ' ᱵᱟ.ᱣᱮᱵ ᱱᱚᱰᱚ ᱥᱮᱨᱟᱱᱮ ᱮᱢ.ᱯᱤᱰᱷ ᱚᱞᱯᱚ ᱠᱟᱱᱟ ।

ᱞ) '᱐᱕᱑᱘᱙. ᱵᱚᱫᱚᱞᱮ ᱢᱟᱱᱮ ᱐᱓ᱨᱤᱛᱮ ᱱᱚᱰᱚ ᱥᱮᱨᱟᱱᱮ' ᱣᱮᱵ ᱵᱟ.ᱣᱮᱵ ᱱᱚᱰᱚ ᱥᱮᱨᱟᱱᱮ ᱵᱟᱦᱚᱱᱟ ᱚᱞᱯᱚ ᱠᱟᱱᱟ ।

P.T.O.

4. ᱡᱟᱦᱟᱸ ᱜᱮ ᱵᱟᱨᱭᱟ ᱠᱩᱠᱞᱤ ᱨᱮᱭᱟᱜ ᱛᱮᱞᱟ ᱚᱞ ᱢᱮ (Answer any two questions): 25X2=50

ᱚ) ᱥᱟᱱᱛᱟᱲᱤ ᱯᱟᱹᱨᱥᱤ ᱟᱨ ᱥᱟᱶᱦᱮᱫ ᱚᱱᱚᱞ ᱨᱮ ᱥᱟᱨᱚᱫᱟ ᱯᱨᱚᱥᱟᱫᱽ ᱠᱤᱥᱠᱩ ᱚᱠᱟ ᱥᱟᱛᱟᱢ ᱠᱚᱭ ᱥᱟᱢ ᱨᱟᱠᱟᱢ ᱟᱠᱟᱫᱟ ᱚᱞ ᱥᱚᱫᱚᱨ ᱢᱮ ।

ᱛ) ᱥᱟᱱᱛᱟᱲᱤ ᱯᱟᱹᱨᱥᱤ ᱨᱮᱭᱟᱜ ᱩᱛᱱᱟᱹᱣ ᱨᱮ ᱯᱚᱱᱫᱤᱛ ᱨᱚᱜᱷᱩᱱᱟᱛᱷ ᱢᱩᱨᱢᱩ ᱟᱜ ᱠᱟᱹᱢᱤᱦᱚᱨᱟ ᱚᱞ ᱥᱚᱫᱚᱨ ᱢᱮ ।

ᱵᱟᱝᱠᱷᱟᱱ/ OR

ᱜ) ᱥᱟᱱᱛᱟᱲᱤ ᱦᱚᱲ ᱠᱟᱹᱦᱱᱤ ᱠᱚ ᱨᱮᱭᱟᱜ ᱥᱟᱛᱟᱢ ᱟᱨ ᱡᱚᱥ ᱵᱟᱵᱚᱛ ᱚᱞ ᱥᱚᱫᱚᱨ ᱢᱮ ।

ᱝ) ᱥᱤᱫᱩ ᱠᱟᱹᱱᱦᱩ ᱟᱜ ᱥᱟᱱᱛᱟᱲ ᱦᱩᱞ ᱨᱮᱭᱟᱜ ᱚᱨᱥᱚᱝ ᱚᱞ ᱢᱮ ।

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2023

ARABIC

PAPER-I

Time Allowed – 3 Hours | Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

The figure in the margin indicate marks for each question

Section-A

أجب عن أي واحد من الأسئلة التالية: ٢٥

١. ما هو علم اللسانيات؟ بين أهميتها في العصر الراهن.
٢. ما هو علم اللغة وما هو علم الأصوات؟ أذكرهما بالتفصيل.

Section-B

أجب عن أي إثنين من الأسئلة التالية: 25x2=50

١. ما ذا تعرف عن المستثنى؟ بيّن جميع أنواعه بالتفاصيل.
٢. ما هو إسم الفاعل و إسم الظرف؟ وضّحهما بالأمثلة.
٣. ما هو الفعل؟ بيّن جميع أقسامه بالأمثلة.

Section-C

ترجم أي إثنين من الفقرات التالية من العربية إلى الإنجليزية: 25x2=50

١. يحتفل العديد من الدول حول العالم في الأول من شهر مايو/أيار بـ"عيد العمال"، ويعتبر هذا اليوم عطلة رسمية في أكثر من ١٠٠ دولة، فما قصة هذا العيد؟ منذ منتصف القرن التاسع عشر، كانت الولايات المتحدة تعيش بداية الثورة الصناعية، وكان العمال الأوروبيون المهاجرون إلى "العالم الجديد" يمثلون الشريحة الأكبر في القوة العاملة في أمريكا. كانت ظروف العمل مروعة والأجور متدنية وساعات العمل طويلة، وأصبحت الإضرابات العمالية في العقد الثامن من القرن التاسع عشر شائعة جداً. وكان من بين قادة الحركة العمالية الأمريكية عدد كبير من الاشتراكيين والشيوعيين وغيرهم من اليساريين الذين كانوا يؤمنون بضرورة القضاء على النظام الرأسمالي من أجل إنهاء الاستغلال. وكان العديد من هؤلاء القادة مهاجرين من أصول ألمانية. في عام ١٨٨٦، دعا اتحاد نقابات العمال في الولايات المتحدة إلى إضراب في الأول من مايو أيار للمطالبة بثماني ساعات عمل يومياً.

٢. قالت كل من الولايات المتحدة والاتحاد الأوروبي إنهما يبحثان فرض مزيداً من العقوبات على إيران، بعد هجومها على إسرائيل في عطلة نهاية الأسبوع. وقالت وزيرة الخزانة الأميركية، جانيت يلين إنه من المعتزم أن تتخذ إجراءً في هذا الصدد، "خلال الأيام المقبلة"، بينما قال مسؤول السياسة الخارجية بالاتحاد الأوروبي، جوزيب بوريل إن الاتحاد يعمل على تنفيذ ذلك. وقد حثت إسرائيل حلفاءها على فرض عقوبات على برنامج طهران الصاروخي. إذ تنتهي العقوبات التي فرضتها الأمم المتحدة على البرنامج في أكتوبر / تشرين الأول القادم، وكانت تلك العقوبات مرتبطة باتفاق أوسع للحد من برنامج إيران النووي. ويبدو، حتى الآن، أن إسرائيل

لم تزد على الشمس بسوء من شكل رد لدونالد ترمب عبر وجهه زوبعة خارجية أكثر من ٢٠ دقيقة على فرض عقوبات على برنامج إيران النووي

٣. تعد الهند من أكبر دول العالم من حيث عدد السكان، إذ يبلغ عدد سكانها ١٤٠ مليار نسمة، أما بين الأرقام ذات الصلة بالانتخابات وأعداد الناخبين مذهلة. ومن المقرر إجراء التصويت لانتخاب ٤٢٣ نائباً على مراحل في بداية أسبوع على أن تنتهي في الأول من شهر يونيو/ حزيران المقبل وتظهر النتائج في اليوم من نفس الشهر . ويبلغ عدد من لهم حق التصويت في الهند ٩٦٩ مليون مواطناً. ويجري التصويت على ثمانية مراحل لأسباب أمنية ولوجستية نظراً لأن الأولى، وقالت لجنة الانتخابات إن كبار السن والمعاقين يمكنهم التصويت من المنزل عن طريق الاقتراع البريدي. وقال كومار: "سوف نمد فرقنا جهوداً إضافية للوصول إلى كل ناخب، سواء كانوا في الغابات أو على الجبال المغطاة بالثلوج. سنذهب على ظهور الخيل أو سيارة أو قارب أو حتى عن طريق المروحيات، سنصل إلى كل مكان".

Section-D

ترجم أي إثنين من الفقرات التالية من الإنجليزية إلى العربية: 25x2=50

1. Supreme Court, quoting an 1854 letter of a tribal chief to the then US President saying that "the earth does not belong to man;, said, "Article 48A impose a clear mandate upon the state as a Directive Principle of State Policy, while Article 51A (g) correspondingly cast a duty upon a citizen to protect and improve the nature environment including forest, lakes, rivers and wildlife and to have compassion for fellow living creatures. This is second verdict in two months where SC has sought to elevate environment protection to the same pedestal as fundamental rights. Last month, in a case dealing with protection of the great Indian Bustard, the court had underscored the importance of protection of environment although it also said this had to be balanced with the need to ensure faster development.

2. A 98-year-old Ukrainian woman said she walked 10 km under shelling, supporting herself with sticks and sleeping on ground, leaving Ocheretyne in Donetsk, now occupied by Russia, and trying to reach areas controlled by Kyiv. In a video posted by Ukaraine's police on Monday, the woman Lidia Stepanivna, said she had walked without food or water, and fell several times but her "character" kept her going. "I survived the war (WWII), and I am surviving this war, "she said in a video, which shows her sitting on a bed in a shelter. She had been walking alone for several hours when two Ukrainian soldiers stopped their car and one asked: "Grandma, where are you going?" "I said I am going as far as I can go, and then I will fall on grass and spend the night there'" she said. The troops then called the police, who took her to a shelter in Pokrovsk town.

3. The Election Commission planes to deploy 596 companies of central forces at the booth during the fourth phase of pooling for the Lok Sabha Election on May 13. Counting the state police, around 70,000 uniformed personal will be on duty. Currently there are over 500 companies of central forces in the state. More companies

can be allotted from the ... a state. The EC ... monitoring in booth had ... keeping a close eye on the third ... Malda, Jangipur and Murshidabad seats.

Section-E

أجب عن أي واحد من الأسئلة التالية: ٢٥

١. ما هو الفرق بين الاستعارة و التشبيه. وضّح بالأمثلة.
٢. ما هي الفصاحة و البلاغة؟ بيّن بالتفاصيل.

2023

ARABIC
PAPER-II

Time Allowed-3 H0urs *Full Marks-200*

If the questions attempted are access of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

The figure in the margin indicate marks for each question

SECTION-A

العصر الجاهلي

أجب عن أي خمسة من الأسئلة التالية: 30X5=150

١. " لو لا شعر فرزدق لذهب ثلث اللغة" وضّح هذه العبارة بالتفصيل.
٢. أكتب ملاحظة مفصلة حول تسمية المعلقات السبع.
٣. كيف تطورت اللغة العربية في العصر الأموي؟ بيّنها بالتفاصيل.
٤. أكتب عن حركة الرومانسية في الأدب العربي الحديث.
٥. أكتب عن حياة أحمد شوقي كأمير الشعراء في العصر الحديث.
٦. ألق الضوء على حياة إمرئ القيس كأمير الشعراء في العصر الجاهلي.
٧. ما هي العصبة الأندلسية؟ أكتب عن نشأتها و تطورها و اسهاماتها في الأدب العربي.
٨. من كانت نازك الملائكة؟ و ما كانت خدماتها في مجال الشعر الحر؟ ناقشها!

SECTION-B

١. بيّن معنى الكلمات التي تحتها خط مع ذكرمفردها و جمعها للأسماء و صيغها للأفعال: ١٠

الا ابلغ الأحلاف عنّي رسالة و ذبيان هل أقسمتم كل مقسم
فلا تكتمنّ الله ما في نفوسكتم ليخفى و مهما يكتم الله يعلم
يؤخّر فيوضع في كتاب فيدّخر ليوم الحساب أو يعجّل فينقم
وما الحرب إلا ما علمتم و ذقتم وما هو عنها بالحديث المرجّم
متى تبعثوها تبعثوها ذميمة و تضر إذا ضرّيتموها فتضرم

٢. إشرح الأبيات التالية مع ذكر السياق و السباق. ١٠

بأنّ ا المطعمون إذا قدرنا وأنّا المهلكون إذا ابتلينا
وأنا المانعون لما أردنا وأنّا النازلون بحيث شئنا
وأنّا الت اركون إذا سخطنا وأنّا الآخذون إذا رضينا
وأنّا العاصمون إذا أطعنا وأنّا العازمون إذا عصينا
ونشرب إن وردنا الماء صفوا ونشرب غيرنا كدرا وطينا

٣. إشرح العبارة مع ذكر السياق و السباق. ١٥

أَنَّهُ رَأَى جُرَذًا يَحْفِرُ فِي سَدِّ مَأْرِبَ، الَّذِي كَانَ يَحْبِسُ عَلَيْهِمُ الْمَاءَ، فَيُصَرِّفُونَهُ حَيْثُ شَاءُوا مِنْ أَرْضِهِمْ، فَعَلِمَ أَنَّهُ لَا بَقَاءَ لِلسَّدِّ عَلَى ذَلِكَ، فَاعْتَزَمَ عَلَى النُّقْلَةِ مِنَ الْيَمَنِ، فَكَادَ قَوْمَهُ، فَأَمَرَ أَصْغَرَ وَلَدِهِ إِذَا أَغْلَظَ لَهُ وَلَطَمَهُ أَنْ يَقُومَ إِلَيْهِ فَيَلْطِمَهُ، فَفَعَلَ ابْنُهُ مَا أَمَرَهُ بِهِ، فَقَالَ عَمْرٌو: لَا أُقِيمُ بِبَلَدٍ لُطِمَ وَجْهِي فِيهِ أَصْغَرُ وَلَدِي، وَعَرَضَ أَمْوَالَهُ. فَقَالَ أَشْرَافٌ مِنْ أَشْرَافِ الْيَمَنِ: اغْتَنِمُوا غَضْبَةَ عَمْرٍو، فَاشْتَرَوْا مِنْهُ أَمْوَالَهُ. وَانْتَقَلَ فِي وَلَدِهِ وَوَلَدِ وَلَدِهِ. وَقَالَتِ الْأَزْدُ: لَا نَتَخَلَّفُ عَنْ عَمْرِو بْنِ عَامِرٍ، فَبَاعُوا أَمْوَالَهُمْ، وَخَرَجُوا مَعَهُ.

١٥

٤. شكّل العبارة الآتية مع ذكر كاتبها:

وانظر في ذلك ما حكاه المسعودي في أخبار الفرس عن المؤبذان صاحب الدين عندهم أيّام بهرام بن بهرام و ما عرّض به للملك في انكار ما كان عليه من الظلم والغفلة عن عائدته على الدولة بضرب المثال في ذلك على لسان البوم حين سمع الملك أصواتها و سأله عن فهم كلامها فقال له: إن بوما ذكرا **يروم لنكاح بوم انثى و أنها شرطت عليه عشرين قرية من الخراب في أيام بهرام فقبل شرطها و قال لها: ان دامت أيام الملك الطعنك الف قرية و هذا أسهل مرام.** فتنبه الملك من غفلته و خلا بالمؤبذان و سأله عن مراده فقال له: أيها الملك ان الملك لا يتم عزه الابالشريعة و القيام لله بطاعته والتصرف تحت امره و نهيه، ولا قوام للشريعة الا بالملك، ولاعز للملك الا بالرجال، ولا قوام للرجال الا بالمال، ولا سبيل إلى المال الا بالعمارة، ولاسبيل الى العمارة الا بالعدل، و العدل الميزان المنصوب بين الخليقة نصبه الرّب وجعل له قيما وهو الملك.

2023

STATISTICS

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any four* questions.

1. (a) Give the axiomatic definition of probability. Show that conditional probability satisfies all the axioms.

   (b) Suppose X is distributed with PDF,

   $$f(x)=\frac{1}{2\beta}e^{-|x-\theta|/\beta},\ -\infty<x<\infty.$$

   Show that $P\{|X-\theta|>a+b\,||X-\theta|>a\}$ does not depend on a for any $a, b>0$. 18+12=30

2. Suppose a random variable X has the following PDF,

   $$f(x)=ae^{(-x^2-bx)},\ -\infty<x<\infty$$

   for constants a (>0) and b.

   (a) If $E(X)=-3/2$, find a and b.

   (b) Obtain the second, third and fourth central moments of X. 15+15=30

3. If $(X,Y)\sim N_2(0,0,1,1,\rho)$,

   (a) show that $\text{correlation}(X^2,Y^2)=\{\text{correlation}(X,Y)\}^2$.

   (b) find $E\left(e^{\frac{1}{2}XY}\right)$. 18+12=30

4. Suppose $X_2\sim N(0,\text{variance}=5)$ and

   $$X_1=1+2X_2-X_2^2/10^3.$$

   (a) Find $\text{Var}(X_1)$ and $\text{Cov}(X_1, X_2)$.

   (b) Find an upper bound of $\{\text{Cov}(X_1,X_2)\}^2$ and compare with the actual value. Comment on the results. 12+15+3=30

Please Turn Over

5. (a) State and prove Neymar-Fisher Factorization theorem for discrete families of distributions.

   (b) Suppose a N(unknown) faced regular die is thrown 17 times independently. If X_k is the outcome of the kth throw, find a sufficient statistic for N, $k = 1, 2, ..., 17$. 18+12=30

6. (a) Find a most powerful size α test for testing

   $H_0 : X \sim N(0, \text{variance} = 1/2)$ ag

   $H_1 : X \sim$ Cauchy $(0, 1)$.

   (b) State and prove Neymar-Pearson Fundamental Lemma. 18+12=30

Group-B

Answer *any two* questions.

7. (a) Define Sampling Frame and Sampling Design with examples.

   (b) Describe the advantages of sample surveys over the census.

   (c) How do you select a simple random sample of 11 households from a list of 112 households in a village without replacement? Describe any two methods. 8+12+20=40

8. (a) Distinguish between stratified random sampling and two stage sampling procedures.

   (b) Under a linear systematic sampling procedure, propose an unbiased estimator of population mean. Also find its variance.

   (c) What is ratio estimator? Find its exact bias. How do you estimate population mean using ratio estimation? Is such an estimator unbiased? 8+12+20=40

9. (a) Describe three basic principles of experimental design.

   (b) What is confounding in the context of factorial designs? Distinguish between partial and complete confounding through examples.

   (c) Consider the one-way ANOVA model

   $$y_{ij} = \mu + \alpha_i + e_{ij},\ i = 1, \cdots, p;\ j = 1, \cdots, n_i$$

   with $\sum_{i=1}^{p} n_i \alpha_i = 0$.

   Define SSA $= \sum_{i=1}^{p} n_i \left(\bar{y}_{io} - \bar{y}_{oo}\right)^2$

   $$\text{SSE} = \sum_{i,j} \left(y_{ij} - \bar{y}_{io}\right)^2, \text{ where}$$

   $$\bar{y}_{io} = \frac{1}{n_i} \sum_{j=1}^{n_i} y_{ij},\ \bar{y}_{oo} = \sum_{i=1}^{p} n_i \bar{y}_{io} \Big/ \sum_{i=1}^{p} n_i .$$

   If e_{ij}'s are *iid* normal random variables with mean zero and variance σ^2, derive E(SSA) and E(SSE). 12+8+20=40

2023

STATISTICS

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and the same language.*

Group-A

1. Answer *any ten* questions: 10×10=100

(a) Describe control charts for fraction defectives.

(b) Distinguish between chance and assignable causes of variation with examples.

(c) What are the functions of Central Statistical Office (CSO)?

(d) Define Crude Death Rate (CDR). Discuss its merits and demerits.

(e) Minimize $z = 20x_1 + 10x_2$ by finding the extreme points of the feasible space. Subject to the restrictions:

$$x_1 + 2x_2 \leq 40$$
$$3x_1 + x_2 \geq 30$$
$$4x_1 + 3x_2 \geq 60$$
$$x_1 \geq 0, x_2 \geq 0.$$

(f) What is exponential smoothing method of forecasting? Why is it called exponentially weighted moving average method?

(g) What is a life table? What are its uses? Write down the assumptions required for the construction of life tables.

(h) What do you mean by cost of living index numbers? What are its uses?

(i) What is homogeneity error in the measurement of price index numbers? How is it controlled?

(j) Distinguish between acceptance rejection and acceptance rectification type sampling plans.

(k) What are the different tests for index numbers? Does Laspeyre's price index satisfy all these tests?

(l) Distinguish between Neonatal and Perinatal mortality rates.

(m) How National Income is estimated in India through production approach?

(n) Describe moving average method of trend determination.

(o) Describe main functions of West Bengal Bureau of Applied Economics and Statistics.

Group-B

Answer *any five* questions.

2. (a) Define natural tolerance limits and give its applications.

   (b) Construct the range chart for process control. 8+12=20

3. (a) Define GRR and NRR. What happens if NRR = GRR?

   (b) Define TFR. If in some region number of female births is exactly one third of the total number of births, deduce a relation between GRR and TFR under appropriate conditions. 8+12=20

4. (a) Describe a sequential sampling plan, when observations are classified either defective or non-defective. Derive the boundaries explicity taking type I and type II error probabilities as α and β, respectively.

   (b) Derive an approximate expression of oc-function corresponding to the plan described (a) above. 10+10=20

5. (a) Describe a double sampling plan for attributes. Derive the explicit expression of the oc function for the above plan.

   (b) Derive the expression of ASN clearly for the plan given in 5 (a) above under appropriate conditions. 12+8=20

6. (a) Define "reliability". If an item has a random lifetime x, define its reliability function for a mission time of t. If x has the PDF, $f(x) = xe^{-x}, x > 0$, find the reliability function for mission time t.

   (b) Define "failure rate". Establish a relation between failure rate and reliability function. How do you derive the PDF of a lifetime random variable from given failure rate? 10+10=20

7. (a) Distinguish between "autoregressive" and "moving average" processes. Show that under certain conditions (to be stated by you), an AR (1) process can be expressed as an MA (∞) process.

   (b) Derive the correlogram of a stationary AR (2) process. 8+12=20

8. (a) Deduce the following relations:

   (i) $T_x = \frac{1}{2} l_x + \sum_{t=1}^{\infty} l_{x+t}$

   (ii) $p_x = \frac{e_x}{1 + e_{x+1}}$

   With usual notations.

   (b) Show that ratio of Laspeyre's price and quantity index is proportional to the ratio of Paasche's price and quantity index. 12+8=20

9. (a) If $x_1 = 2, x_2 = 3, x_3 = 1$ is a feasible solution to the following LPP,

$$\begin{aligned} \text{Maximize} \quad & Z = x_1 + 2x_2 + 4x_3 \\ \text{Subject to:} \quad & 2x_1 + x_2 + 4x_3 = 11 \\ & 3x_1 + x_2 + 5x_3 = 14, \\ & x_1 \geq 0, x_2 \geq 0, x_3 \geq 0, \end{aligned}$$

find a basic feasible solution.

(b) A businessman has the option of investing his money in two plans. Plan A guarantees that each rupee invested will earn seventy paise a year, hence while plan B guarantees that each rupee invested will earn two rupees two years hence. In plan B, only investments for periods that are multiples of two years are allowed. How should he invest ten thousand rupees in order to maximize the earnings at the end of 3 years? Formulate this problem as an LP problem. 12+8=20

2023

Pali

Paper-I

Time allotted-3Hours Full Marks-200

If the questions attempted are in excess of the prescribed number , only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored .

Candidates may use **Devnagari** or **Roman** or **Bengali** script in their answers.

Quotations or expressions in Pali .

Group-A

1. Explain Grimm's Law. 12
2. Define the term 'Pali' and its characteristics. 2+18=20
3. Explain **any three** of the following phonetic changes in Pali with suitable examples: 6x3=18
   a. Cerebralisation
   b. Anaptyxis
   c. Vowel for vowel
   d. Treatment of Sanskrit Dipthongs in Pali

Group-B

4. Define the term 'Sandhi'. How many Sandhis are there in Pali? Discuss the rules of any of the Sandhis with suitable examples. 18

5. How many Karakas are there in Pali? Describe any one of them. 12

6. a. Decline either 'latā' or 'muni' in Nominative and Dative form in both numbers. 4

b. Conjugate either √ bhu or √kṛ in the ditiyā 4

c. Make simple sentences using any three of the following: 4x3=12

puppha , gacchati, mā, dahara ,sāyaṃ, adhunā.

Group-C

7 . Translate into English *either* of the following verses adding grammatical notes on the underlined words: 10+4=14

a. **Bāhitapāpo**'ti brāhmaṇo samacariyā samaṇo'ti vuccati
Pabbājayattano malaṃ tasmā pabbajito'ti vuccati.

b. Akkodhano vigatakhīlo hamasmi (iti bhagavā)
Anutīre mahiyekarattivāso,
Vivaṭā kuṭi nibbuto 'gini
Atha ce patthayasi **pavassa** deva

8. Translate into English *either* of the following prose extracts adding grammatical notes on the underlined words: 10+4=14

a. Evaṃ me sutaṃ ekaṃ samayaṃ bhagavā antarā ca rājagahaṃ antarā ca nālandaṃ addhānamaggapaṭipanno hoti mahatā bhikkhusaṅghena saddhiṃ **pañcamattehi** bhikkhusatehi. Suppiyo'pi kho paribbājako antarā ca rājagahaṃ antarā ca nālandaṃ addhānamaggapaṭipanno hoti saddhiṃ antevāsinā brahmadattena māṇavena.

b. Atha kho bhagavā parittaṃ udakāvasesaṃ udakādhāne **thapetvā** āyasmantaṃ rāhulaṃ āmantesi 'passasi no tvaṃ rāhula imaṃ parittaṃ udakāvasesaṃ udakādhāne ṭhapita'nti. Evam bhante, evaṃ parittaṃ kho rāhula tesaṃ sāmaññaṃ yesaṃ natthi sampajāna musāvāde lajjāti.

Contd...P/3

9. Translate into Pali either of the following passages: 22

a. *The man speaks.* The warrior leaves. The god is a non-human. The person speaks thus. The human lives . *The son sits down.*

b. The lay disciples enter the village. They go to the minister. The lay disciples enter the village. The ascetics meditate. He reaches the top. He gives alms

Group-D

10. Write an essay in Pali on the following topic: 50

a. Majjhima Paṭipadā

b. Nibbāna

c.Kammavāda

2023

Pali

Paper-II

Time allotted-3Hours Full Marks-200

If the questions attempted are in excess of the prescribed number , only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored .

Candidates may use **Devnagari** or **Roman** or **Bengali** script in their answers.

Quotations or expressions in Pali .

Group- A

Answer Question No.5 and **any two** from the rest.

1. What is the meaning of Vinaya? What is the nucleus of *Vinaya* ? Discuss any one of the book of *Vinaya Piṭaka* . 2+2+26=30
2. What do you know about '*Anupiṭaka*'? Explain any one text of this *Piṭaka*.2+28=30
3. Where the second Buddhist Council was held? Discuss the cause and effect of the council. 2+28=30
4. Give the brief description of Life of Buddha with the special reference to Pali literature. 30
5. Write short notes on any four of the following: 10x4= 40

   a. Pācittiya b. Dhammapada c. Jātaka d. Asoka e. Tantrayana

Group- B

Attempt all questions. Answers in this group should be in **Pali**

6. Give the summary of *Parayana vagga /Yamaka Vagga.* 30

or

Give a brief life sketch of *Kaccāyana Thera /Subha Jivakambabanika Theri.* 30

7. Summarise the fundamental theory of '*Dhamma cakka Pavattana Sutta*' 30

or

Briefly describe the subject matter of '*Singālovāda sutta*'. 30

8. Explain with appropriate examples any four of the following: 10x4=40

a. Malini b. Tanumajjhā c. Indravajirā d. Vasantatilaka e. Dhammopamā

2023

LAW

PAPER-I

MWC(O)-L-I/23

Time Allowed – 3 Hours

Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English** or in **Bengali** but all answers must be In one and same language.

GROUP A

Answer any three questions

1. (a) " The Preamble to the Constitution sets out the aims and aspirations of the people of India." To what extent have they been translated into the various provisions of the Constitution? (20)
   (b) What is the nature of Indian Constitution? Do you think it is a Federal Constitution? Discuss. (20)

2. (a) Explain how the Fundamental Right to Education evolved. What limitations are now placed on this right by the Supreme Court? (20)
   (b) Are provisions relating to preventive detention "undemocratic and harsh"? Discuss briefly the safeguards available to a person detained under the law of preventive detention. (20)

3. (a) Examine critically the relationship between the Fundamental Rights and Directive Principles of State Policy in the light of decided cases and the constitutional amendments. (20)
   (b) "Fundamental Duties are only ethical and moral duties and should not form a part of Fundamental law". Comment. (20)

4. (a) Examine the conditions under which emergency can be proclaimed under Article 352 of the Constitution. Point out the safeguards against undue prolongation of the emergency. (20)

   (b) What is the meaning of ' Failure of Constitutional machinery in a State' ? To what extent is the satisfaction of the President in this regard subject to review by the courts? Discuss. (20)

5. (a) Enumerate the various procedures of amending the Constitution . Discuss the limits of the amending powers. (20)
   (b) "The doctrine of basic structure has established judicial supremacy in the area of constitutional amendment". "Examine. (20)

P.T.O.

6. Write notes on any two of the following: (20+20)
   (a) Doctrine of Prospective Overruling
   (b) Advisory Jurisdiction of the Supreme Court
   (c) Pardoning Power of the Governor
   (d) Doctrine of Pith and Substance

GROUP B

Answer any one question

7. (a)" International Law is defined as 'vanishing point of Jurisprudence". (Holland). Examine this view point with reference to the nature of International Law. (20)
   (b) " The relationship between International Law and Municipal Law is one of coordination and interdependence". Discuss. (20)

8. (a) "Asylum ends where extradition begins" Explain the statement. (20)

   (b) The prohibition of genocide is considered to be a jus cogens norm. (20)

   i. Explain what jus cogens means.
   ii. Explain at least two legal effects of the fact that the prohibition of genocide is a jus cogens norm.

GROUP C

Answer any one question

9. (a) Write down the conceptual framework of the term "Jurisprudence". Discuss the importance and necessity of Administration of Justice. (20)

   (b) What is the purpose and function of law? (20)

10. (a) Define custom. State the importance of custom. What are the requisites of a valid custom? (20)
    (b) Explain the concept of ownership and discuss the essential elements of ownership. (20)

2023

MWC(O)-L-II/23

LAW

PAPER-II

Time Allowed – 3 Hours

Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English** or in **Bengali** but all answers must be In one and same language.

GROUP A

Answer Question 1 and any three questions from the rest of GROUP A

1. Answer any four of the following: 5x4
   (a) Malicious Prosecution
   (b) Contributory Negligence
   (c) Public Nuisance
   (d) Res Ipsa Loquitu8r
   (e) Vis Major
   (f) Extortion

2. (a) " All torts are civil injuries but all civil injuries are not torts" Explain the statement. (10)
   (b) Distinguish between tortious liability and contractual liability. (10)

3. (a)Discuss the rule of strict liability with the help of relevant case laws. Is there any difference between strict liability and absolute liability? (10)
   (b) When do the courts award exemplary damages in an action for torts? (10)

4. (a) "The law of criminal conspiracy insists on the agreement between two or more persons whereas in abetment by conspiracy a mere engagement between them may be sufficient" Explain. (10)
   (b) Critically examine the statement with reasons and examples: " The offence of riot is not committed unless all the five elements are present". (10)

5. (a) "Right of private defence is available only against offences." Discuss. (10)
   (b) " In murder cases sentence of imprisonment for life is the rule and death sentence an exception." Discuss. (10)

6. (a) Distinguish between criminal breach of trust and criminal misappropriation of property. (10)
   (b) What changes are incorporated in the law dealing with rape in the recent past? (10)

P.T.O.

GROUP B

Answer Question 7 and any three questions from the rest of GROUP

7. Write short notes on any four of the following: 5x4

(a) Quasi contracts

(b) Doctrine of Frustration

© Undue Influence

(d) Minor Partner

(e) Promissory Note

(f) Caveat Emptor

8(a) State the exceptions to the rule that an agreement without consideration is void? (10)

(b) What are wagering contracts? Differentiate between wagering and contingent contract? (10)

9.(a) Who are the persons by whom a contract may or must be performed? Can a contract be performed by a person other than a party to it? (10)

(b) Define Novation. What are the various kinds of Novation? (10)

10. (a) What is meant by breach of contract and what are the different remedies available to an aggrieved party as a result of a breach of contract? (10)

(b) "A contract shall not be enforced if the agreement is opposed to public policy". Examine. (10)

11. (a) Define the contract of guarantee. How surety can be discharged from his liability in contract of guarantee? (10)

(b) What is the contract of bailment? When and how can it be revoked? (10)

12(a) What is a contract of agency? Discuss its essentials. (10)

(b) Discuss the rights and obligations of undisclosed principal and his agent vis-a vis the other party to the contract. (10)

Contd.....P-3

GROUP C

Answer Question 13 and any one from rest of GROUP C

13. Answer any four of the following: (4x5)

(a) Res- gestae

(b) Judgement in Rem

© Professional Communication

(d) Law of Presumption

(e) Burden of Proof

(f) Documentary evidence

14. (a) When is hearsay evidence admissible and why ? (10)

(b) State the exceptions to the rule and the principle underlying such exception. (10)

15(a) What is the scope of cross examination and re- examination of the witness? (10)

(b) Dying Declaration is admitted in evidence by way of exception to the general rule. Explain .(10)

2023

MEDICAL SCIENCE
PAPER-1

Time allowed – 3 hours *Full Marks – 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored

Answers may be given either in English or in Bengali. But all answers must be in one and the same language.

All questions carry equal marks

1. Answer any *four* of the following:

a) Describe the attachments of flexor retinaculum. Enumerate the structures passing deep to and superficial to the retinaculum. What is carpal tunnel syndrome? 2 + 5 + 3

b) What is cardiac output? Describe the factors controlling cardiac output. 2 + 8

c) Describe the mechanism of skeletal muscle contraction. What is the role of ATP in muscle contraction? 7 + 3

d) Classify hypoxia with examples of each class. Describe the pathogenesis of carbon monoxide poisoning. 6 + 4

e) Describe the modified Duke's criteria for diagnosis of infective endocarditis. 10

f) Define health care-associated infections (HAI). What are the common types of HAI. Describe the pathogenesis of the most common type. 2 + 2 + 6

2. Answer any *four* of the following:

a) Enumerate different types of porphyria and name the enzyme responsible for each. What are the causes of neurological manifestations in acute intermittent porphyria (AIP)? Why do the symptoms worsen after barbiturate administration? 6 + 2 + 2

b) What is oedema? What are the factors responsible for formation of oedema? Explain with examples. Write the pathogenesis of cardiac oedema. 2 + 3 + 5

c) What is post-mortem staining? How to differentiate it from bruise? Write the medicolegal importance of post-mortem staining. 1 + 6 + 3

d) What is anion gap? Describe its role as an indicator of acidosis. Enumerate compensatory mechanism of respiratory acidosis 2 + 6 + 2

e) Describe the ovarian cycle on a hormonal basis. 10

f) Describe the cytogenetic basis and clinical features of Down's syndrome. 2 + 8

P.T.O.

3. Answer any *four* of the following:

a) What are muscle spindles? Describe the stretch reflex with a labelled diagram. 2 + 8

b) Describe the pathogenesis of myocardial infarction. 10

c) What is megaloblastic anaemia? Describe the laboratory diagnosis of a case of megaloblastic anaemia. 2 + 8

d) Enumerate different types of type II hypersensitivity. Describe the pathogenesis of each type with an example. 3 + 7

e) What is normal pH of urine? How the normalcy of pH is maintained in urine? 1 + 9

f) Describe the expected health-related changes of climate change. 10

4. Answer any *four* of the following:

a) What is medical negligence? Write the difference between professional misconduct and medical negligence. 2 + 8

b) What is protein energy malnutrition (PEM). Discuss PEM with special reference to Kwashiorkor disease. 2 + 8

c) What are reticulocytes? Discuss the role of reticulocytes in diagnosis of different types of anaemia. What is ineffective erythropoiesis? 2 + 6 + 2

d) What is status epilepticus? Describe the management of status epilepticus. 2 + 8

e) Describe different types of aphasia with reference to lesions in different areas of brain. 10

f) Write down the features which help to differentiate between accidental and homicidal drowning 10

5. Answer any *four* of the following:

a) Discuss the MTP Act, 1971 mentioning the indications and MTP Rule (2003). 5 + 5

b) What are the diagnostic criteria of diabetes mellitus. Describe the management of diabetic ketoacidosis. 2 + 8

c) Describe the clinical features and management of poisonous viper bite. 4 + 6

d) Write the pathogenesis of bronchial asthma. How do you treat a case of acute severe asthma? 5 + 5

e) Describe the NACO guidelines for post-exposure prophylaxis after needle stick injury 10

f) Describe the role of platelets in haemostasis. What are the causes of thrombocytopenia? 6+4

2023

MEDICAL SCIENCE

PAPER-II

Time Allowed – 3 Hours | Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.

1. Write short notes on <u>any four:</u> 10x4

   (a) HELLP Syndrom
   (b) Mechanism of normal labour
   (c) Causes and management of genito-urinary fistula
   (d) Puberty menorrhagia
   (e) Hydatidiform mole

2. Outline management of <u>any four:</u> 10x4

   (a) Post partum haemorrhage (primary type)
   (b) Multiple fibroid with heavy bleeding in 40 yrs old patient
   (c) Pre-eclampsia at 36 gestational age of primigravida mother
   (d) PCOD in 25 yrs aged patient with infertility
   (e) Anemia in pregnancy

3. Briefly explain <u>any four</u> of the following: 10x4

   (a) Genital tuberculosis
   (b) Combined oral contraceptive pills – complications and non-contraceptive benefits
   (c) Partograph must be used in normal labour
   (d) Cervical cerelage operation
   (e) Inj. $MgSo_4$ must be given in Eclampsia

4. Differentiate of the <u>any four</u> of the following: 10x4

   (a) Placenta Previa and Abruptio Placentae
   (b) Mild Pre-eclampsia and Severe Pre-eclampsia
   (c) Benign and malignant ovarian tumour
   (d) Partial mole and complete mole
   (e) First Trimester abortion and Ectopic Pregnancy

5. Enumerate <u>any eight</u> of the following: 5x8

(a) Usefulness of partograph in labour
(b) Mini-pill
(c) Risk factors for pelvic organ prolapse
(d) HPV vaccine
(e) Red degeneration of fibroid
(f) Maternal and fetal complications of Multiple Pregnancy
(g) Cryptomenorrhoea
(h) Methods of induction of labour
(i) Antenatal Corticosteroid injection
(j) Hydrops foetalis

2023

MANAGEMENT

PAPER –I

Time Allowed - 3 Hours *Full Marks-200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English or in Bengali** but all answers must be in one and same language.

Group –A

Answer any three questions

1.(a) "Scientific management aim's at replacement of traditional techniques by scientific techniques". In light of this statement, explain the principles of F.W.Taylor.

(b) "The behavioural scientists criticised the early management approaches for their insensitiveness to the human side of the organisation". Share your views on this explaining the Hawthorne experiments and the major outcomes of the study.

(c) Discuss the roles of a manager as evident in the 21st Century. 20+10+10

2.(a) Explain the different types of planning. Discuss the importance of planning.

(b) Explain the steps you will follow to implement MBO in an organization.

(c) Distinguish between 'Decentralisation' and 'Delegation'. (10+10)+10+10

3.(a) What do you understand by 'span of management'? Explain three important factors that determines the span of management.

(b) Explain the 'Trait' and 'Behavioural' theories of leadership. (5+15)+10+10

4.(a) Explain the determinants of personality.

(b) "The process of perception starts with confrontation and ends with reaction". Share your thoughts explaining the process of perception with an example.

(c) Explain the steps you will take to manage interpersonal conflict in an organization. Make necessary assumptions. 10+10+20

5.(a) Explain the concept of 'supply chain management' with reference to any consumer durable company of your choice.

(b) Explain the concept of 'Enterprise Resource Planning' and discuss the benefits an organization can derive by implementing ERP. 20+10+10

P.T.O.

Group-B

Answer any two questions

6. (a) Explain line, functional and line & staff organization with appropriate examples.

(b) Explain the steps in Rational Decision making process in an organization.

(c) Explain the stages in group development. Discuss the guidelines you will follow in case of group decision making. 10+10+ (10+10)

7.(a) As a manager of a reputed automobile company, explain how will you motivate your employees with the help of an appropriate theory of motivation. Make necessary assumption.

(b) Explain the control process. Discuss the traditional and modern techniques of control that you think will be relevant in today's dynamic business world. 20+20

8.(a) Define learning. Explain the different models of learning.

(b) What do you understand by 'planned change'? Discuss the reasons for which an individual resist to change in an organization and explain how will you manage change in an Organization. (5+10)+(5+10+10)

9. Write short notes on any two of the following-
(a) Six Sigma
(b) Attitude & Values
(c) Business Process Reengineering
(d) Contemporary school/Modern era of Management 20x2

2023

MANAGEMENT

PAPER –II

Time Allowed -3 Hours | Full Marks-200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English or in Bengali** but all answers must be in one and same language.

Answer any FIVE questions

1. (a) Explain the micro and macro environmental factors that are to be kept in mind in 21st Century by business organization.

   (b) Explain the steps involved in the consumer buying process for purchase of any consumer durable product. Make necessary assumptions. 20+20 = 40

2. (a) Explain the different sources from where you are going to recruit marketing executives for a reputed automobile company. Make relevant assumptions.

   (b) Discuss the steps involved in the selection process to find the right person for the right job.

   (c) As a Human Resource Manager, suggests the different on the job and off the job training methods you will implement to train the employees of any FMCG company. Make suitable assumptions. 10+10+20 = 40

3. (a) Consider yourself to be the marketing head of any leading footwear company and describe the different bases of segmentation you will adopt to identify your target audience. You are free to make necessary assumptions.

   (b) "Brand exists in our head and heart". In light of this statement, explain with examples the common positioning strategies adopted by brands in today's dynamic business world. 20+20 = 40

4. (a) Explain the various traditional and modern methods of performance appraisal that can be implemented for employees of any television manufacturing company.

   (b) Explain the steps involved in the collective bargaining process. 20+20 = 40

5. (a) Explain Porter's 5 Forces framework.

   (b) Explain the BCG matrix with the help of an appropriate diagram. 20+20 = 40

6. (a) Explain the concept of 'Working Capital Management'.

   (b) Differentiate between 'Operating Leverage' and 'Financial Leverage'.

   (c) Discuss the concept of 'Capital Budgeting'. 15+15+10 = 40

P.T.O.

7. (a) Devise a promotional strategy by making use of the various elements of IMC for a newly launched brand of water purifier. Make necessary assumptions.

   (b) Explain the different stages of the 'Product Life Cycle' with the aid of a diagram.

20+20 = 40

8. Write short notes on any four of the following : 10 x 4 = 40

   (a) PERT AND CPM

   (b) SWOT Analysis

   (c) 7Ps of Service Marketing

   (d) Quality Circles

   (e) Pricing methods

   (f) Linear Programming

2023

ANIMAL HUSBANDRY AND VETERINARY SCIENCE

PAPER-I

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer *any three* questions.

1. (a) Write down the Animal Husbandry Programme for rural development.

   (b) Define the social group. Write down about type of social group and its their function.

   10+5+15+10=40

2. (a) Define Puberty. Write down the factors in details causing the infertility.

   (b) Write down the composition of Semen and how to preserve the Semen.

   (c) Write in details the advantage of Artificial.Insemination. 15+15+10=40

3. (a) Write the partition of feed energy in animals and strategies used to methane emission from ruminants.

   (b) Define feed additives used in poultry diet.

   (c) Write benefits and limitation of microbials in animal feed. 10+15+15=40

4. (a) What are the objectives of green forder conservation?

   (b) Write in details about the crops suitable for silage and step in silage making in field condition.

   (c) Discuss the feeding strategies with emphasis on early lactation for high producing dairy cows. 10+15+15=40

Group-B

Answer *any four* questions.

5. (a) Describe silent contribution of Mendel's Principles of inheritance.

   (b) Briefly discuss the Mendel law of Independent Assortment with suitable example.

   (c) How do you view the contribution of G. J. Mendel in understanding the mechanism of inheritance?

   (d) Write the method of selection of dairy animals.

   (e) Write important breed of sheep. 10+10+10+10=40

6. Attempt *any four* questions:

   (a) Write important poultry breed in India.

   (b) Write difference between inbreeding and outbreeding in animal husbandry.

   (c) Write the major and trace minerals and their sources.

   (d) Write down the grading of eggs.

   (e) Write negative feedback mechanism of hormonal regulation. 10+10+10+10=40

2023

ANIMAL HUSBANDRY AND VETERINARY SCIENCE

PAPER-II

Time Allowed — 3 Hours *Full Marks — 200*

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer Question No. 1 *and* any two *from the rest.*

1. Answer *any ten* from the following: 6×10=60

   (a) Draw and describe the air sac of fowl.

   (b) Write the difference between endotoxin and exotoxin.

   (c) Write the full form of TCA, write in details about TCA.

   (d) Write the blood supply of head and gives the all branches with suitable diagrams.

   (e) Write the glycogen metabolism in muscle.

   (f) How we can conserve wildlife? Write the types of wildlife conservation.

   (g) Draw and describe the laryngeal cartilage of ox.

   (h) Write the pathological stages of pneumonia in goat.

   (i) Write the causes of diarrhoea and treatment of ox.

   (j) Write the symptom of B.Q. with specific treatment of cattle.

   (k) Write the different type of hernia.

2. Draw and describe formation, branching, course, distribution pattern of lumbo-sacral plexus in dog. 20+20=40

3. Write etiology, pathogenesis, clinical findings, diagnosis and treatment of Brucellosis. 3+7+10+10+10=40

4. (a) Differentiate between organophosphorus and organochlorine poisioning in animal. Discuss the treatment in both insecticide poisoning of calves.

   (b) Write down the layers of Retina. Describe in details about lamies of eye. (10+10)+(10+10)=40

Please Turn Over

Group-B

Attempt *any two* questions.

5. (a) Draw the bacterial growth curve.
   (b) Write the function of liver.
   (c) Write in details etiology, symptoms, diagnosis and treatment of Rabies. 10+10+10=30

6. Write in details etiology, pathogenesis, symptom and treatment of Tryponsomisis. 10+10+10=30

7. Write short on the following: 6×5=30
   (a) Ligament of liver
   (b) Milk fever and treatment
   (c) Snake bite poisioning and treatment
   (d) Dignosis of Tympany and clinical finding
   (e) Fever

2023

SOCIOLOGY

PAPER-I

Time Allowed – 3 Hours

Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.

Group-A

Answer any three questions

1) From the viewpoint of growing importance of multidisciplinary, how do you relate sociology to other social sciences especially when the scope of Sociology been changing in the context of globalisation? 40

2) Elucidate the relevance of Parsonian Social systems in present society? 40

3) 'Ideal Types' of bureaucracy proposed by Max Weber are 'mental constructs'; they do not correspond to the reality. Give your views. 40

4) "The sociological imagination enables us to grasp history and biography and the relationship between the two in a society." – C.W. Mills. Explain with your life-based examples. 40

5) Explain how post-industrial society is distinctly different from the previous societal forms i.e. from nomadic to industrial societies. Also, draw reference in distinguishing between post-industrial society with that of classical societies as conceptualized by Durkheim, Marx and Weber. 20+20

Group- B

Answer any two questions

6) Illustrate with examples about the Experimental design in sociological research. Discuss its distinctive uses over survey and field research methods. 25+15

7) Examine with appropriate examples how Durkheim and Merton explicate anomie. 40

8) How has the idea of 'Work from Home' forced us to redefine the formal and informal organisation of work? 40

2023

SOCIOLOGY

PAPER-II

Time Allowed – 3 Hours | Full Marks – 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in **English** or in **Bengali** but all answers must be in one and same language.

Group-A

Answer any three questions

1) Examine the dialectical relation between tradition and modernity in the study of social change with reference to Indian society. 40

2) Explicate G.S. Ghurye's Indological approaches towards study of Indian society. Critically examine the relevance of his approach in contemporary Indian society. 20+20

3) How are Hierarchy and Exclusion the major impediments in the transformation of Indian societies? Discuss 40

4) In the light of judicial intervention on 'Live-in relationships', discuss the future of marriage with special reference to India? 40

5) Discuss how 'environmentalism' can be explained with new social movements approach. Illustrate giving examples from India. 40

Group-B

Answer any two questions

6) How is the increasing use of technology is changing the status of women in Indian society? 40

7) Examine how rise of old population is becoming a major problem in India. What kind of policy interventions would you propose to address their problems? 20+20

8) Do you think that the social media has brought significant changes in creating awareness about various social problems prevalent in Indian society? Argue your case. 40