

this necessity for exertion we find the chief source of human advancement—the advancement of individuals as well as of nations. It has led to most of the splendid mechanical inventions and improvements of the age. It has stimulated the ship-builder, the merchant, the manufacturer, the machinist, the tradesman and skilled workman. In all departments of productive industry it has been moving power. It has develop the resources of this and of other countries—the resources of the soil and the character and qualities of the men who dwell upon it. It seems to be absolutely necessary for the purpose of stimulating the growth and culture of every individual. It is deeply rooted in man, leading him every to seek after and endeavour to realise, something better and higher than he has yet attained.

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ENGLISH

Time : Three Hours]

[Maximum Marks : 80

Note : All questions are compulsory.

1. Explain with reference to the context any *one* of the following extracts : 10

In Belmont is a lady richly left;

And she is fair, and, fairer than that word,

Of wondrous virtues; sometimes from her eyes

I did receive fair speechless messages :

Her name is Portia, nothing under valued

To Cato's daughter, Brutus's Portia;

Or

All that glitters is not gold;

Often have you heard that told :

Many a man his life hath sold

But my outside to behold :

Gilded tombs do worms enfold.

Had you been as wise as bold.

2. Explain any *two* of the given terms : 5

- (i) Plot (ii) Tragedy
- (iii) Tragedy-Comedy (iv) Audience.

3. Answer any *three* questions in about 30 words each : 15

- (i) Who is Antonio ?
- (ii) Why did Portia and Herissa appear in the court under disguise ?
- (iii) What kind of a lender is Shylock ?
- (iv) What is there in the Caskets ?
- (v) Why does Bassanio need money from Antonio ?

4. Answer any *two* questions in about 250 words each : 15

- (i) Attempt the character sketch of Portia.
- (ii) Analyse the portrayal of female characters by Shakespeare in the play.
- (iii) Comment on the Trial Scene.

5. Write a letter to the Minister of Health of your state for appointing a radiologist in the Kalpana Chawala Medical College and Hospital as patients have to go to private diagnostic centres. 10

Or

Write a letter to the Chairperson of your Municipal Committee regarding the insanitary conditions in your locality, which are leading to dengue.

6. Write one word substitution of any *eight* expressions : 8

- (i) A speech or writing too full of words.
- (ii) One who talks continuously.
- (iii) One who is particular about the smallest detail.
- (iv) A medicine which can cure all diseases.
- (v) Something which cannot be read.
- (vi) Lasting a short time.
- (vii) The killing of an infant.
- (viii) One who reads book eagerly.
- (ix) A person going out of a country.
- (x) Something which is certain to happen.

7. Write a short note on any *one* term : 7

- (a) Memo (b) RTL.

Or

Write an e-mail to the Department of Panchayat Raj regarding the Digital Voter Cards of the students studying in the colleges.

8. Attempt a precis of the given passage and assign a suitable title : 10

Success grows out of struggles to overcome difficulties. If there were no difficulties, there would be no success. If there were nothing to struggle or compete for, there would be nothing achieved. It is well, therefore, that men should be under the necessity of exerting themselves. In

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ENGLISH (Compulsory)

Paper : II

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt all questions.

- 1. Explain with reference to the context : 8**

If it were done when 'tis done, then it were well
It were done quickly. If the assassination
Could trammel up the consequence, and catch,
With his surcease success; that but this blow
Might be the be-all and the end-all here,
But here, upon this bank and shoal of time,
We'd jump the life to come.

Or

Wash your hands, put on your night gown,
Look not so pale. I tell you yet again,
Banquo's buried; he cannot come out on's grave.

- 2. Attempt any four questions in about 150 words each : 4×5=20**
- (a) What predictions do the witches make about Macbeth and Banquo in their first meeting with them ?

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P.T.O.

- ### 3. Attempt a character sketch of Macbeth.

Comment on the dramatic significance of the opening scene in 'Macbeth'. **10**

- (c) Develop a dialogue based primarily on that of exchanges on the situations given below :
Two friends meet at a wedding party. Write in brief the conversation between them.

- Of

Your nurse has been called and you go to the public station to lodge a complaint. While down the conversation between you and the public is over.

7. निम्नलिखित सभी वस्तुनिष्ठ प्रश्नों के उत्तर दीजिए : 10

- (क) 'आचार्य रामचन्द्र शुक्ल' जी के अनुसार कर्म और फल की मिली-जुली अनुभूति को क्या कहते हैं ?
- (ख) मिल्लू का प्रिय भोजन क्या था ?
- (ग) 'सदाचार का ताबीज' के लेखक कौन हैं ?
- (घ) शिवजी ने अंदर और बाहर का तुक मिलाने के लिए किसको चुना ?
- (ङ) 'मेरे राम का मुकुट भीग रहा है' निबंध में राम का अंगरक्षक किसे कहा है ?
- (च) 'विद्युत के पथ पर' निबंध में लेखक ने कितने दिन की यात्रा का वृत्तांत वर्णन किया है ?
- (छ) हरियाणा की हिन्दी दो प्रमुख बोलियों के नाम लिखिए ।
- (ज) आपात्काल में भारत में प्रेस पर किस वर्ष सेंसर लगाया गया ?
- (झ) हरियाणवी भाषा में लिखित किसी एक नाटक का नाम लिखिए ।
- (ञ) फीचर की परिभाषा लिखिए ।

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हिन्दी (अनिवार्य)

Time : Three Hours]

[Maximum Marks : 80

नोट : सभी प्रश्न अनिवार्य हैं ।

1. निम्नलिखित में से किन्हीं दो पर उपसंग व्याख्या कीजिए : 14

- (क) योगी को रोग से, कैदी को कैद से, ऋणी को ऋण से, कंगाल को दरिद्रता से—इसी प्रकार हरेक क्लेशित पुरुष को एक दिन अपने क्लेश से मुक्त होने की आशा होती है । चाहे उसे इस जीवन में क्लेश से मुक्ति न मिले, पर आशा के सहारे इतना होता है कि वह धीरे-धीरे अपने क्लेशों को झेलता हुआ एक दिन इस क्लेशमय जीवन से तो मुक्त हो जाता । पर हाय ! जब उसको यह आशा भी भंग हो जाए, उस समय उसके कष्ट का क्या ठिकाना !

- (ख) दुःख के वर्ग में जो स्थान भय का है, वही स्थान आनंद-वर्ग में उल्हास का है । भय में हम प्रस्तुत कठिन स्थिति के नियम के विरोध रूप में दुःखी और कभी-कभी उस स्थिति से अपने को दूर रखने के लिए प्रयत्नवान् भी होते हैं । उल्हास में हम आने वाली कठिन स्थिति के भीतर साहस के अवसर के निश्चय द्वारा प्रस्तुत कर्म-सुख की उमंग से अग्रसर रहनेवाले होते हैं ।

(ग) जमाना बदलता रहा है, अपने वृक्षों और लताओं ने वातावरण से समझौता किया है, कितने ही मैदान में जा बसे हैं और खरासी प्रतिष्ठा प्राप्त कर ली है, लेकिन देवदार है कि नीचे नहीं उतरा, समझौते के रास्ते नहीं गया और उसने अपनी खानदानी चाल नहीं छोड़ी। झूमता है तो ऐसा मुस्कुराता हुआ, मानो कह रहा हो, मैं सब जानता हूँ, सब समझता हूँ।

(घ) कैसे मंगलमय प्रभात की कल्पना थी और कैसे अँधेरी कालरात्रि आ गयी है ? एक-दूसरे को देखने से डर लगता है। घर मसान हो गया है, अपने ही लोग भूत-प्रेत बन गये हैं, पंड़ सूख गए हैं, लताएँ कुहलता गयी हैं। नदियों और सरोवरों को देखना भी दुस्सह हो गया है। केवल इसलिए कि जिसका ऐश्वर्य से अभिषेक हो रहा था, वह निर्वामित हो गया।

2. 'महादेवी वर्मा' का साहित्यिक परिचय लिखिए। 10

अथवा

'हरिशंकर परसाई' की साहित्यगत विशेषताओं का वर्णन कीजिए।

3. निम्नलिखित प्रश्नों में से किन्हीं चार का लगभग 150-150 शब्दों में उत्तर दीजिए : 16

(क) 'आचार्य रामचंद्र शुक्ल' जी की निबंध कला पर प्रकाश डालिए।

(ख) 'तिब्बत के पथ पर' निबंध का सार अपने शब्दों में लिखिए।

(ग) 'हरिशंकर परसाई' जी की भाषा-शैली पर एक नोट लिखिए।

(घ) 'आशा का अंत' निबंध में 'बालमुकुंद गुप्त' जी ने लार्ड कर्जन को भारत की दशा का कैसा वर्णन किया है ?

(ङ) 'आचार्य हजारी प्रसाद द्विवेदी' जी ने देवदार के माध्यम से क्या संदेश दिया है ?

(च) 'मेरे राम का भीगै मुकुटवा' गीत सुनकर 'श्री विद्यानिवास मिश्र' जी को क्या स्मरण हो आया ?

4. हरियाणवी भाषा का उद्भव और विकास अपने शब्दों में लिखिए। 10

अथवा

हरियाणवी कविता की प्रवृत्तियों का उल्लेख कीजिए।

5. निम्नलिखित प्रश्नों में से किन्हीं दो के लगभग 150-150 शब्दों में उत्तर दीजिए : 10

(क) हरियाणवी भाषा की कौनसी बोली पर प्रकाश डालिए।

(ख) हरियाण की सांग परंपरा पर नोट लिखिए।

(ग) हरियाणवी गद्य साहित्य का परिचय दीजिए।

(घ) हरियाणवी कहानी का सर्वाधिक परिचय दीजिए।

6. निम्नलिखित प्रश्नों में से किन्हीं दो का लगभग 150-150 शब्दों में उत्तर दीजिए : 10

(क) पत्रकारिता कितने प्रकार की होती है ? विवेचन कीजिए।

(ख) शीर्षक की संरचना पर एक नोट लिखिए।

(ग) फीचर लेखन की परिभाषा देते हुए उसके लेखन की विशेषताएँ लिखिए।

(घ) स्वतंत्र प्रेस की अवधारणा पर एक नोट लिखिए।

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हिन्दी (ऐच्छिक)

Time : Three Hours]

[Maximum Marks : 80

नोट : सभी प्रश्नों के उत्तर दीजिए ।

1. निम्नलिखित अवतरणों में से किन्हीं दो का परिचय दीजिए :

- (i) नब्बे वर्ष के तपस्वी के चेहरे पर रोग जर्जरता की हल्की छाप थी पर थकावट का नाम न था । इसे देखकर गाँव वाले चकित हुए ही बेनी माधव जी भी चकित हो गए । सूकर खेत में भी बाबा के दर्शनार्थ बड़ी भीड़ आया करती थी, पर वहाँ हवा फैल गई थी कि बाबा चार महीने रहेंगे इसलिए दर्शनार्थियों की दैनिक संख्या में संतुलन आ गया था । उन्हें विश्राम करने का अवसर मिल गया ।

- (ii) चित्रकूट क्षेत्र में प्रवेश करते ही बाबा के जरा-जीर्ण गाल में मानो फिर से तरुणाई आ गई । उनके मानस लोचनों में सीता सहित तापस वेषधारी धनुर्धर राम-लक्ष्मण ललक-ललककर उभरने लगे । दूर-दूर हरे-भरे पर्वतों की चोटियाँ जगह-जगह झरते हुए मनोरम झरने, धनुष की कमान-सी बहती हुई पयस्विनी नदी बाह्य दृष्टि को जिधर भी सौंदर्य लुभाता था उधर ही उन्हें अपने आराध्य दिखलाई पड़ने लगते थे ।

(iii) राम सौंदर्य पुंज है । बाबा ने जब-जब जितनी सुंदरता देखी है तब तब उनकी कल्पना का राम सौंदर्य अवचेतना के कुहासे से और अधिक निखरकर प्रकट हुआ है । यह भाव-विकास का क्रम पिछले कई वर्षों से बढ़ा है । सारा चित्रकूट क्षेत्र राम में रमा हुआ आत्मविस्मृतकारी लग रहा है और बाबा चल रहे हैं और बाहरी गति में उनका ध्यान इस समय तनिक भी नहीं है ।

(iv) मूसलाधार पानी में भीगाता निराशा में दूबा हुआ रामबोला कुछ क्षणों तक स्तब्ध खड़ा रहा, फिर धीरे-धीरे अपनी गिरी हुई झोंपड़ी के पास आया । देखा, पार्वती अम्मा का हाथ वैसे ही बाहर निकला भीग रहा था । उनके मुँह और शरीर पर भीगते छप्पर का बोझ भी यथावत् ही था । रामबोला की मनोपीड़ा कुछ कर गुजरने के लिए चंचल हो उठी ।

2×6=12

2. 'मानस का हंस' का देशकाल और वातावरण का चित्रण कीजिए ।

अथवा

'मानस का हंस' उपन्यास की भाषा-शैली पर प्रकाश डालिए ।

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3. निम्नलिखित चार लघुतरंग प्रश्नों में से दो का उत्तर दीजिए : 2×3=6

- अमृतलाल नागर के जीवन का परिचय
- 'मानस का हंस' का उद्देश्य
- 'मानस का हंस' उपन्यास में कल्पना
- 'मानस का हंस' उपन्यास का पुरातन ।

4. निम्नलिखित अवतरणों में से किन्हीं दो की सप्रसंग व्याख्या कीजिए : 2×6=12

(i) पूरी रात होने के कुछ क्षण पूर्व झील के दो चेहरे हो जाते हैं—एक हंसता हुआ, दूसरा सोया हुआ । पानी बंट जाता है, आधा जल गहरा हरा, कहीं-कहीं श्यामल-आधा सफेद जैसे किसी ने चूने का चिट्ठा चूरा पानी में घोल दिया हो अंधेरा बढ़ते-बढ़ते यह सफेदी धीरे-धीरे झील के श्यामल हिस्से को अपने में ढांप लेती है । झील का रंग आकाश के रंग से मिल जाता है—मानो आस-पास की पहाड़ियों के बीच आकाश का ही एक टुकड़ा तारों समेत नीचे आकर औंधा पड़ गया है ।

(ii) नारद ने सोचा कि यहाँ वजन की समस्या खड़ी हो गई । साहब बोले, भई, सरकारी पैसे का मामला है । प्रेशन का केस वीसों दफ्तारों में जाता है । देर लग ही जाती है, बीमों बार एक ही बात को बीस जगह लिखना पड़ता है, तब पत्रकी होती है जितनी पेन्शन मिलती है, उतनी ही स्टेशनरी लग जाती है । हाँ, जल्दी भी हो सकता है ।

(iii) मनुष्यों के पूर्वजों को जिन दो-एक खोपड़ियों के आधार पर उसके विकास की स्थितियाँ निर्धारित की जाती हैं, कुछ वैसी ही खोपड़ियाँ आज की कुछ आदिवासी तथा हनारी जातियों के किन्हीं विशिष्ट व्यक्तियों की भी या मय मनुष्य जाति के ही किन्हीं विशेष अपवादस्वरूप व्यक्तियों की भी तो हो सकती हैं । एक-एक खोपड़ी के आधार पर लगाए गए अनुमान क्या बहुत अधूरे और अनिश्चित अनुमान नहीं हैं ?

(iv) सामाजिक परम्पराओं में मैं घोर क्रांतिकारी और भारत के बूढ़े हैं घोर दकियानूसी पर हम दोनों में कभी टक्कर नहीं हुई । जब मैंने सार्वजनिक रूप से अपनी पत्नी को परदे से बाहर ला खड़ा किया, तो मेरे कस्बे पर बिजली-सी गिर पड़ी, इस चर्चा के सिवा लोगों को और जैसे कुछ काम ही न था । चौधरी लोगों ने तो इसे पंचायत बुलाने का विषय समझा ।

5. 'अशोक के फूल' निबन्ध का सार अपने शब्दों में लिखिए ।

अथवा

'मेरे पिताजी' शीर्षक निबन्ध की मूल संवेदना प्रकट कीजिए ।

7

6. निम्नलिखित चार लघुतरीय प्रश्नों में से किन्हीं दो के उत्तर दीजिए : 2×3=6

- (i) 'मोहन राकेश की डायरी' निबन्ध का सार
- (ii) 'घीसा' निबन्ध का उद्देश्य
- (iii) 'भोलाराम का जीव' निबन्ध की मूल संवेदना
- (iv) 'अस्ति की पुकार हिमालय' निबन्ध की भाषा लिखिए ।

7. गीतिकाल्य की परिभाषा बताते हुए उसके स्वरूप को निर्धारित कीजिए ।

अथवा

काव्य प्रयोजन किसे कहते हैं ? प्रमुख काव्य प्रयोजनों का उदाहरण सहित वर्णन कीजिए ।

10

8. निम्नलिखित लघुतरीय प्रश्नों में से दो के उत्तर दीजिए : 2×5=10

- (i) काव्य हेतु
- (ii) महाकाव्य की परिभाषा भारतीय दृष्टिकोण से
- (iii) खण्ड काव्य की परिभाषा लिखिए ।
- (iv) काव्य का स्वरूप एवं भेद ।

9. निम्नलिखित वस्तुनिष्ठ प्रश्नों के उत्तर दीजिए : 10×1=10

- (i) आचार्य वामन द्वारा काव्य-प्रयोजन की परिभाषा
- (ii) आचार्य मम्मट द्वारा काव्य-प्रयोजन की परिभाषा
- (iii) यमक अलंकार की परिभाषा देकर लिखिए ।
- (iv) सोरठा की परिभाषा लिखिए ।
- (v) भरतमुनि द्वारा रस की परिभाषा ।
- (vi) महादेवी वर्मा का 'घीसा' निबन्ध में गंगा पार किस गाँव के प्रति आकर्षण रहा ?

(vii) 'अशोक के फूल' निबन्ध के आधार पर रवीन्द्रनाथ टैगोर ने भारतवर्ष को क्या कहा है ?

(viii) 'अस्ति की पुकार हिमालय' निबन्ध में रवीन्द्र प्रसाद द्विवेदी ने कहा है जहाँ देश का अस्ति है, भूगोल या जाति के रूप में नहीं—यह कथन निबन्धकार ने किस रूप में माना है ?

(ix) 'मानस का हंस' उपन्यास किस प्रसिद्ध कवि को आधारित बनाकर लिखा गया है ?

(x) 'मानस का हंस' के 'आमुख' में लिखा है कि किसकी मही जीवनकथा नहीं 'मालती' ?

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PUNJABI

Punjabi (Elective)

Time : Three Hours]

[Maximum Marks : 80

1. ਕਿਸੇ ਇਕ ਕਵੀ ਦੇ ਜੀਵਨ, ਰਚਨਾ ਅਤੇ ਦ੍ਰਿਸ਼ਟੀ ਉਤੇ ਇਕ
ਚਰਚਾ-ਡਰਾਮਾ ਲਿਖੋ :

(ਉ) ਸ੍ਰੀ ਗੁਰੂ ਗੋਬਿੰਦ ਸਿੰਘ ਜੀ

(ਅ) ਸ਼ਾਹ ਹੁਸੈਨ

2. ਕਿਸੇ ਦੇ ਕਾਵਿ-ਟੋਟਿਆਂ ਦੀ ਸੁਪ੍ਰਸੰਗ ਵਿਆਖਿਆ ਕਰੋ :

(ਉ) ਜਿਨਿ ਪਾਇਆ ਪ੍ਰਭੁ ਆਪਣਾ ਆਦੇ ਤਿਸਹਿ ਰਾਣਾ ॥

ਇਕ ਬਿਨੁ ਤਿਸੁ ਬਿਨੁ ਜੀਵਣਾ ਬਿਰਥਾ ਜਨਮੁ ਜਣਾ ॥

ਜਲਿ ਥਲਿ ਮਹੀਅਲਿ ਪੂਰਿਆ ਰਵਿਆ ਵਿਚਿ

ਵਣਾ ॥

(ਅ) ਨਦੀਉਂ ਪਾਰ ਰਾਂਝਣ ਦਾ ਠਾਣਾ,

ਕੀਤਾ ਕਉਲ ਜਗੁਰੀ ਜਾਣਾ,

ਮਿਨੰਤਾਂ ਕਰਾਂ ਮਲਾਹਿ ਨਾਲਾ

ਉੜਕਿ ਕੰਮ ਅਲਾਹਿ ਨਾਲਾ।

(ੳ) ਸਾਹਿਬਾਂ ਪੜ੍ਹੇ ਪਟੀਆਂ, ਮਿਰਜਾ ਪੜ੍ਹੇ ਕੁਰਾਨ।

ਵਿਚ ਮਸੀਤ ਦੇ ਲਗੀਆਂ, ਜਾਣੇ ਕੁਲ ਜਹਾਨ।

ਨਾ ਮਾਰ ਕਾਜੀ ਛਮਕਾਂ, ਨਾ ਦੇਹ ਤਤੀ ਨੂੰ ਤਾਵਿ।

ਪੜ੍ਹਨਾ ਸਾਡਾ ਕਹਿ ਗਿਆ, ਲੈ ਆਏ ਇਸ਼ਕ ਲਿਖਾਇ।

(ਸ) ਚੋਟ ਪਈ ਦਮਾਸੇ ਦਲਾ ਮੁਕਬਲਾ।

ਦੇਵੀ ਦਸਤ ਨਰਾਈ ਸੀਹਣ ਸਾਰ ਦੀ।

ਪੇਟ ਮਲੰਦੇ ਲਾਈ ਮਹੇ ਦੈਤ ਨੂੰ।

ਗੁਰਦੇ ਆਂਦਾ ਖਾਈ ਨਾਲੇ ਹੁਕਸੇ।

ਚੋਟੀ ਜਾਣ ਦਿਖਾਈ ਤਾਰੇ ਖੁਸ ਕੇਤ।

3. ਆਦਿ ਕਾਲ (1500 ਵੀ. ਤਕ) ਦੇ ਸਮੇਂ ਵਿਚ ਰਹੇ ਗਏ ਪੰਜਾਬੀ ਸਾਹਿਤ ਉੱਤੇ, ਇਕ ਵਿਸ਼ੇਸ਼ ਨੋਟ ਲਿਖੋ।

ਜਾਂ

ਕਿਸੇ ਇਕ ਕਾਵਿ ਖਾਸ ਉਪਰ ਚਰਚਾ ਕਰੋ :

(ੳ) ਕਿੱਸਾ ਕਾਵਿ ਧਾਰਾ

(ਅ) ਸੂਫੀ ਕਾਵਿ ਧਾਰਾ

4. ਹੇਠ ਲਿਖੇ ਸਾਹਿਤ-ਰੂਪਾਂ ਵਿੱਚੋਂ ਕਿਸੇ ਦੇ ਦੀ ਪਰਿਭਾਸ਼ਾ ਤੇ ਗੁਣ-ਲੱਛਣਾ ਥਾਰੇ ਵਿਚਾਰ ਕਰੋ :

(ੳ) ਨਿੱਕੀ ਕਹਾਣੀ

(ਅ) ਨਾਟਕ

(ੲ) ਨਿਬੰਧ

(ਸ) ਸਫ਼ਰਨਾਮਾ

5. ਹੇਠ ਲਿਖੇ ਪੰਨੇ ਦਾ ਹਿੰਦੀ ਭਾਸ਼ਾ ਵਿਚ ਅਨੁਵਾਦ ਕਰੋ :

ਚਿਨਾਰੀ ਪਿੰਡ ਵਿਚ ਸੋ ਕੁ ਘਰ ਸਨ। ਉੱਥੇ ਉਨ੍ਹਾਂ ਨੂੰ ਇਕ ਢਾਬੇ ਵਾਲੇ ਦੀ ਉੱਪਰਲੀ ਮੰਜਲ ਉੱਪਰ ਇਕ ਕਮਰਾ ਮਿਲ

ਗਿਆ। ਲੇਖਕ ਨੂੰ ਇਹ ਥਾਂ ਬੜੀ ਰੁਮਾਂਟਿਕ ਪ੍ਰਤੀਤ ਹੋਈ। ਕਮਰੇ ਦੇ ਅੱਗੇ ਪਿਛੇ ਵਰਾਂਡਾ ਸੀ। ਨਾਲ ਦੇ ਕਮਰੇ ਵਿਚ ਅੱਧਬਡ ਉਮਰ ਦਾ ਢਾਬੇ ਵਾਲਾ ਆਪਣੀ ਜਵਾਨ ਤੇ ਚੰਚਲ ਪਤਨੀ ਨਾਲ ਰਹਿੰਦਾ ਸੀ। ਢਾਬੇ ਵਾਲਾ ਆਪ ਤਾਂ ਸਾਰ ਦਿਨ ਰੋਟੀਆਂ ਬਣਾਉਂਦਾ ਰਹਿੰਦਾ ਤੇ ਪਤਨੀ ਲੇਖਕ ਵੱਲ ਚੌਰ ਅੱਖਾਂ ਨਾਲ ਹਰ ਸਮੇਂ ਦੇਖਦੀ ਰਹਿੰਦੀ ਸੀ।

6. ਹੇਠ ਲਿਖੇ ਵਾਕਾਂ ਦੇ ਵਚਨ ਬਦਲੋ :

(ੳ) ਵਿਦਿਆਰਥੀ ਨੇ ਅਧਿਆਪਕਾਂ ਅੱਗੇ ਬੇਨਤੀ ਕੀਤੀ।

(ਅ) ਖਿਡਾਰੀ ਚੰਗੀ ਖੁਰਾਕ ਤੋਂ ਬਿਨਾਂ ਵਧੀਆ ਨਹੀਂ ਖੇਡ ਸਕਦਾ।

(ੲ) ਜੇ ਤੁਸੀਂ ਮਿਹਨਤ ਕਰੋਗੇ ਤਾਂ ਤੁਹਾਡੀਆਂ ਤਰੱਕੀਆਂ ਅੱਗੇ ਕੋਈ ਰੁਕਾਵਟ ਨਹੀਂ ਬਣ ਸਕਦਾ।

(ਸ) ਮਾਪਿਆਂ ਦੀ ਕਦਰ ਵਾਲੇ ਬੱਚੇ ਹਮੇਸ਼ਾ ਸਫਲ ਹੁੰਦੇ ਹਨ।

(ਹ) ਮਿਹਨਤਕਸ਼ ਲੋਕ ਈਮਾਨਦਾਰ ਵੀ ਹੁੰਦੇ ਹਨ।

7. ਹੇਠ ਲਿਖੇ ਵਾਕਾਂ ਦੇ ਲਿੰਗ ਬਦਲੋ :

(ੳ) ਮੁੰਡਿਆਂ ਨਾਲੋਂ ਕੁੜੀਆਂ ਹਰ ਖੇਤਰ ਵਿਚ ਅੱਗੇ ਹਨ।

(ਅ) ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਬੋਲਣ ਤੇ ਸੁਣਨ ਵਾਲੇ ਲੋਕ ਹੋਰਨਾਂ ਲੋਕਾਂ ਵਿਚ ਜਲਦੀ ਰਚਮਿਚ ਜਾਂਦੇ ਹਨ।

(ੲ) ਮੇਰੇ ਮਾਮੇ ਦਾ ਮੁੰਡਾ ਫੌਜ ਵਿਚ ਅਫਸਰ ਹੈ।

(ਸ) ਮੇਰੇ ਪਿੰਡ ਦੇ ਲੋਕ ਆਪਸੀ ਸਹਿਮਤੀ ਨਾਲ ਜ਼ਾਦੀਆਂ ਸੰਬੰਧੀ ਖਰਚ ਕਰਦੇ ਹਨ।

(ਹ) ਕ੍ਰਿਕਟ ਦੇ ਖਿਡਾਰੀ ਅਪਣੀਆਂ ਵੇਸਭੂਜਾ ਵਿਚ ਸੁੰਦਰ ਦਿੱਸਦੇ ਹਨ।

8. ਹੇਠ ਲਿਖੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਦਿੱਤੇ ਹੋਏ ਉੱਤਰ ਵਿੱਚ ਇੱਕ ਉੱਤਰ ਛਾਂਟ ਕੇ ਲਿਖੋ :

(i) ਸ੍ਰੀ ਗੁਰੂ ਗ੍ਰੰਥ ਸਾਹਿਬ ਦੀ ਸੰਪਾਦਨਾ ਕਿਸ ਗੁਰੂ-ਕਵੀ ਨੇ ਕੀਤੀ :

- (ੳ) ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਜੀ
- (ਅ) ਗੁਰੂ ਅਰਜਨ ਦੇਵ ਜੀ
- (ੲ) ਗੁਰੂ ਤੇਗ ਬਹਾਦਰ ਜੀ
- (ਸ) ਗੁਰੂ ਗੋਬਿੰਦ ਸਿੰਘ ਜੀ

(ii) ਸ਼ਾਹ ਹੁਸੈਨ ਦਾ ਸੰਬੰਧ ਕਿਸ ਸੂਫੀ ਸੰਪਰਦਾ ਨਾਲ ਰਿਹਾ ਹੈ :

- (ੳ) ਚਿਸ਼ਤੀ (ਅ) ਮਲਾਮਤੀ
 - (ੲ) ਮੁਹਗਵਰਦੀ (ਸ) ਇਸਲਾਮੀ
- (iii) ਮਿਰਜਾ ਤੇ ਸਾਹਿਬਾਂ ਦਾ ਪਿਆਰ ਕਿੱਥੇ ਪਿਆ ਸੀ :

- (ੳ) ਖੇਡ ਦੇ ਸਮੇਂ
- (ਅ) ਮਸੀਤ ਵਿਚ ਪੜ੍ਹਦੇ ਸਮੇਂ
- (ੲ) ਪੰਜਾਗੀ ਦੀ ਹੱਟ ਤੇ

(ਸ) ਨਾਮਜ਼ ਅਦਾ ਕਰਨ ਲਈ ਮਸੀਤ ਜਾਂਦੇ ਹੋਏ

(iv) ਸ੍ਰੀ ਗੁਰੂ ਗੋਬਿੰਦ ਸਿੰਘ ਜੀਦੇ ਦਰਬਾਰ ਵਿਚ ਕਿੰਨੇ ਵਿਦਵਾਨ ਕਵੀ ਸਨ :

- (ੳ) 52 (ਅ) 25
- (ੲ) 75 (ਸ) 65

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(v) ਸ੍ਰੀ ਗੁਰੂ ਗ੍ਰੰਥ ਸਾਹਿਬ ਦੀ ਸੰਪਾਦਨਾ ਕਦੋਂ ਹੋਈ :

- (ੳ) 1607 ਈ. (ਅ) 1605 ਈ.
- (ੲ) 1606 ਈ. (ਸ) 1604 ਈ.

(vi) ਸ਼ੇਖ ਫਰੀ ਦੇ ਸਲੋਕਾਂ ਦੀ ਗਿਣਤੀ ਕਿੰਨੀ ਹੈ :

- (ੳ) 110 (ਅ) 112
- (ੲ) 120 (ਸ) 130

(vii) ਪੰਜਾਬੀ ਵਿਚ ਮਿਰਜਾ ਸਾਹਿਬਾਂ ਦਾ ਕਿੱਸਾ ਕਿਸ ਕਵੀ ਦਾ ਵਧੇਰੇ ਲੋਕਪ੍ਰਿਯ ਹੈ :

- (ੳ) ਗਫਜ਼ ਬਰਖੁਰਦਾਰ (ਅ) ਪੀਠੂ
- (ੲ) ਦਮੋਦਰ (ਸ) ਵਾਰਿਸ

(viii) ਸ੍ਰੀ ਗੁਰੂ ਗ੍ਰੰਥ ਸਾਹਿਬ ਦੇ ਕੁਲ ਕਿੰਨੇ ਪੰਨੇ ਹਨ :

- (ੳ) 1530 (ਅ) 1630
- (ੲ) 1430 (ਸ) 1730

(ix) ਭਾਈ ਗੁਰਦਾਸ ਨੇ ਕਿੰਨੀਆਂ ਵਾਰਾਂ ਦੀ ਰਚਨਾ ਕੀਤੀ ਹੈ :

- (ੳ) 35 (ਅ) 36
- (ੲ) 38 (ਸ) 39

(x) 'ਚੰਡੀ ਦੀ ਵਾਰ' ਵਿਚ ਪ੍ਰਧਾਨ ਰਸ ਕਿਹੜਾ ਹੈ :

- (ੳ) ਸਾਂਤ ਰਸ (ਅ) ਕਰੁਣਾ ਰਸ
- (ੲ) ਬੀਰ ਰਸ (ਸ) ਹਾਸ ਰਸ

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2,400

Roll No.

Total Pages : 03

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SANSKRIT (Compulsory)

Time : Three Hours]

[Maximum Marks : 80

नोट : सभी प्रश्न अनिवार्य हैं ।

1. निम्नलिखित प्रश्नों के उत्तर दीजिए : 8×2=16

- (i) छः ऋतुओं का कारण कौन है ?
- (ii) शुष्णक्षरन्याय से क्या तात्पर्य है ?
- (iii) त्रियामा किसे कहते हैं ?
- (iv) सोमनाथ तीर्थ कहाँ पर है ?
- (v) भट्टहरि के तीन शतक के नाम क्या हैं ?
- (vi) पञ्चतन्त्र के लेखक कौन हैं ?
- (vii) स्वधा के योग में कौनसी विभक्ति होती है ?
- (viii) वषट् के योग में कौनसी विभक्ति होती है ?

2. (क) निम्नलिखित में से किन्हीं दो गद्यांशों का सरलार्थ लिखिए : 2×5=10

- (i) अलं भो अलम् ! मयैव पूर्वमवाचितानि कुसुमानि, त्वं तु चिरं राजावजगरीरिति क्षिप्रं नोत्थापितः, गुरुचरणा अत्र तडागतटे सन्ध्यामुपासते, संस्थापिता मया निखिला सामग्री तेषां समीपे । यां च सप्तवर्षकल्पां यावन्नासेन रुदतीं परमसुन्दरीं त्वं त्रियामाया यामत्रयमनैषीः सेयमधुना स्वपिपति ।

(ii) तत्क्षणमेव च “कुत इदम्” किमिदमिति दृश्यताम् ज्ञायताम्” इत्यादिश्य छात्रेषु विसृष्टेषु क्षणानन्तरं छात्रैर्नैकेन भयभीता सवेगमत्युष्णं दीर्घं निःश्वसती, मृगीव व्याघ्राभ्राता अश्रुप्रवाहै स्नाता, सवेपथुः कन्यकैका अङ्गे निधाय समानीता ।

(iii) स च प्रजाः विलुप्य, मन्त्रिणां निपात्य, प्रतिमां विभेद्य परशतान् जनांश्च दासीकृत्य शतश उष्ट्रेषु रत्नान्यारोप्य स्वदेशमनैषीत् । एवं स ज्ञातास्वादः पौनः पुन्येन द्वादशवारमागत्य भारतमलुलुपठत् । तस्मिन्नेव च स्वसंरम्भे एकदा गुर्जरदेशाच्छादयितं सोमनार्थतीर्थमपि धूलीचकार ।

(iv) गौरसिंहस्तु “कुटीरान्तः कन्यकास्ति, सा च यवनवध व्यसनिनि मयि जीवति न शक्या द्रष्टुमपि, नाम किं स्पष्टम् । तद्यावत्तव कवोष्णशोणितवृषित एष चन्द्रहासो न चलति, तावत् कूर्दनं वा उत्कलं वा यच्चिकीर्षसि तद्विधेहि” इत्युक्त्वा व्यालीढमर्यादया सज्जः समतिष्ठत ।

(ख) किसी एक पंक्ति की व्याख्या कीजिए : 1×6=6
ध्यानवाचस्थितैर्भवदिभानं ज्ञायते कालवेगः ।

अथवा

कार्यं वा साधयेयं देहं वा पातयेयम् ।

3. शिवराज विजय की भाषाशैली की समीक्षा कीजिए । 1×8=8

अथवा

योगिराट का चरित्र-चित्रण कीजिए ।

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4. ब्रह्मचारी के गुरु का चरित्र-चित्रण कीजिए । 1×8=8

अथवा

शिवराजविजय के अनुरूप भारत के उत्थान और पतन का वर्णन कीजिए ।

5. निम्नलिखित में से किन्हीं दो पर टिप्पणियाँ लिखिए : 2×8=16

- (अ) भर्तृहरि
- (ब) बाणभट्ट
- (स) जयदेव
- (द) पञ्चतन्त्र ।

6. (क) चतुर्थी अथवा तृतीया विभक्ति के सन्दर्भ में उपपद विभक्ति को सोदाहरण स्पष्ट कीजिए । 1×5=5

(ख) निम्नलिखित में से किन्हीं दो का वाक्य में प्रयोग कीजिए : 2×2½=5

- (i) इतर
- (ii) उपमा
- (iii) काणः
- (iv) सार्धम् ।

(ग) निम्नलिखित में से किन्हीं छः को शुद्ध कीजिए : 6×1=6

- (i) प्रज्ञाया मुक्त ।
- (ii) प्रजापतिं स्वाहा ।
- (iii) केशानां प्रसितः ।
- (iv) देवदत्ते अन्यः ।
- (v) रामे पृथक् ।
- (vi) भवति शायिका ।
- (vii) मल्लो मल्लादलम् ।

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SANSKRIT ELECTIVE

Time : Three hours]

[Maximum Marks : 80

नोट : सभी प्रश्न अनिवार्य हैं ।

1. निम्नलिखित प्रश्नों के उत्तर दीजिए :

8×2=16

- (i) 'अभिज्ञानशाकुन्तलम्' में कुल कितने अङ्क हैं ?
- (ii) शकुन्तला को दुष्यन्त के पास छोड़ने गए दो ऋषियों के नाम लिखिए ।
- (iii) कालिदास की कुल कितनी रचनाएँ हैं ? उनमें से दो नाटकों के नाम लिखिए ।
- (iv) कालिदास किस अलंकार के लिये प्रसिद्ध हैं ?
- (v) महाभारत के लेखक कौन हैं ?
- (vi) लघुसिद्धान्त कौमुदी के रचनाकार कौन हैं ?
- (vii) जयदेव की रचना का नाम लिखिए ।
- (viii) निबन्ध का क्या अर्थ है ?

2. (अ) निम्नलिखित किन्हीं दो श्लोकों का सरलार्थ कीजिए : 5×2=10

(i) प्रजाः प्रजा स्वा इव तन्त्रयित्वा

निषेवते शान्तमना विविक्ताम् ।

यूथानि संचार्य रविप्रतप्तः

शीतं दिवा स्थानमिव द्विपेन्द्रः ॥

(ii) भवन्ति नम्रास्तारवः फलोद्गमै-

नवान्मुभिर्भूरिविलिम्बनो घनाः ।

अनुद्धताः सत्पुरुषाः समृद्धिभिः

स्वभावा एवैष परोपकारिणाम् ॥

(iii) येन येन विमुञ्च्यन्ते प्रजाः स्निग्धेन बन्धुना ।

स स पातयति तासां दुःखन्तः इति शुष्यताम् ॥

(iv) त्रिश्रोतसं वहति यो गगनप्रतिष्ठां ज्योतीषि-

वर्तयति च प्रविभक्तारश्मिः ।

तस्य व्यपेतरजसः प्रवहस्य

वायोर्मागो द्वितीयहरि विक्रमपूत एषः ।

(ब) निम्नलिखित एक सूक्ति को सप्रसङ्ग व्याख्या कीजिए : 6×1=6

(i) निर्वातस्य प्रदीपस्य शिखेव जरतो मतिः ।

(ii) हंसो हि क्षीरमादत्ते तन्मिश्रो वर्जयत्यपः ॥

3. (अ) कालिदास की रचनाओं का परिचय दीजिए । 1×10=10

अथवा

कालिदास का प्रकृति-चित्रण प्रस्तुत कीजिए ।

(ब) निम्नलिखित में से किन्हीं दो की परिभाषा दीजिए : 2×3=6

सूत्रधारः, विदूषकः, नेपथ्यम्, भरतवाक्यम् ।

4. (अ) भवभूति का जीवन-परिचय तथा रचनाओं का सामान्य परिचय दीजिए । 1×10=10

अथवा

रामायण का महत्त्व प्रतिपादित कीजिए ।

(ब) निम्नलिखित में से किन्हीं दो पर संक्षिप्त टिप्पणियाँ लिखिए :
शिबराजविजय, पञ्चतन्त्र, महाभारत, भारवि । 2×3=6

5. (अ) निम्नलिखित दो सूत्रों की उदाहरण सहित व्याख्या कीजिए :

अजाद्यष्टाप्, उगितश्च, ववसि प्रथमे, यूनीस्ति । 2×4=8

(ब) निम्नलिखित में से किसी एक विषय पर संस्कृत में निबंध लिखिए : 1×8=8

(i) परोपकारः

(ii) मम प्रिय पुस्तकम्

(iii) सत्सङ्गतिः

(iv) संस्कृतभाषायाः महत्त्वम् ।

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HISTORY

Option I

Modern World

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all. Q. No. 1 is compulsory.

The candidates shall attempt *four* more questions, selecting *one* question from each Unit. All questions carry equal marks. The part relating to explanatory note on map will carry full marks for visually handicapped candidates only.

कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है । विद्यार्थियों को शेष चार प्रश्नों के उत्तर प्रत्येक इकाई से कम से कम एक प्रश्न चुनते हुए देने हैं । सभी प्रश्नों के अंक समान हैं । नेत्रहीन विद्यार्थियों के लिए मानचित्र सम्बन्धी व्याख्यात्मक टिप्पणी वाले भाग के पूरे अंक होंगे ।

Compulsory Question (अनिवार्य प्रश्न)

1. Choose the correct answers from the multiple choice questions. Each question carries 2 marks.

बहुविकल्पीय प्रश्नों में से सही उत्तर चुनिए । प्रत्येक प्रश्न 2 अंक का है ।

(i) Which famous painter's creation is 'Monalisa' ?

- (a) Petrarch (b) Titian
(c) Sanzio Raphael (d) Leonardo da Vinci
'मोनालिसा' किस प्रसिद्ध चित्रकार की कृति है ?
(अ) पेट्रार्क (ब) टाइटियन
(स) सॉजियो राफेल (द) लियोनार्दो द विन्सी

(ii) The reformation was started in Germany by :

- (a) Zwingli (b) Calvin
(c) Petrarch (d) Martin Luther
जर्मनी में धर्म-सुधार आन्दोलन का आरम्भ करने वाला था :
(अ) ज्विंगली (ब) काल्विन
(स) पेट्रार्क (द) मार्टिन लूथर

(iii) 'Modern Capitalism' was written by :

- (a) Adam Smith (b) Karl Marx
(c) Werner Sombert (d) Colbert
'मॉडर्न कैपिटलिज्म' नामक पुस्तक के लेखक थे :
(अ) एडम स्मिथ (ब) कार्ल मार्क्स
(स) वर्नर सोम्बर्ट (द) कोल्बर्ट

(iv) Mule was invented by :

- (a) Sammual Crompton (b) John Kay
(c) Hargreaves (d) Carter Wright
मूल का आविष्कार किया :
(अ) सैम्यूल क्रॉम्पटन (ब) जॉन केय
(स) हारग्रीवज (द) कार्टर राइट

(v) Louis XVI was assassinated in which year ?

- (a) 5 May, 1789 (b) 14 July, 1789
(c) 30 September, 1792 (d) 21 January, 1793
लुई सोलहवें की हत्या कब हुई ?

- (अ) 5 मई, 1789 (ब) 14 जुलाई, 1789
(स) 30 सितम्बर, 1792 (द) 21 जनवरी, 1793

(vi) 'Boston Tea Party' incident occurred in :

- (a) 1773 (b) 1775
(c) 1780 (d) 1783
'बोस्टन चाय पार्टी' की घटना कब हुई ?
(अ) 1773 (ब) 1775
(स) 1780 (द) 1783

(vii) When was the 'International African Association' established ?

- (a) 1869 (b) 1876
(c) 1881 (d) 1896
'अन्तर्राष्ट्रीय अफ्रीकी संघ' की स्थापना कब हुई ?
(अ) 1869 (ब) 1876
(स) 1881 (द) 1896

(viii) 'Mein Kampf' was written by :

- (a) Fredrick Ebert (b) Mussolini
(c) Hitler (d) Gottfried Feder
'मेरा संघर्ष' नामक पुस्तक की रचना की :
(अ) फ्रेडरिक एबर्ट ने (ब) गुसोफ्रीड फेडर ने
(स) हिटलर ने (द) गॉटफ्रायड फेडर ने

Unit I (इकाई I)

2. Examine the main causes of Renaissance.
मुनर्जाण के उत्थान के प्रमुख कारणों की समीक्षा कीजिए ।
3. Examine the impact of the Agricultural Revolution in Western Europe.
पश्चिमी यूरोप में कृषि क्रान्ति के संभावों का परीक्षण कीजिए ।

Unit II (इकाई II)

4. Describe the social, economic, religious and intellectual causes of the French Revolution (1789 A.D.)
फ्रांसीसी क्रान्ति (1789 ई.) के सामाजिक, आर्थिक, धार्मिक तथा बौद्धिक कारणों का वर्णन कीजिए ।
5. Discuss the results of the First World War.
प्रथम विश्वयुद्ध के परिणामों की चर्चा कीजिए ।

Unit III (इकाई III)

6. Give a critical analysis of the Peace Settlement of 1919-20.
1919-20 ई. के शान्ति समझौते का आलोचनात्मक विश्लेषण कीजिए ।
7. What were the factors responsible for the rise of fascism in Italy.
इटली में फासीवाद के उत्थान के क्या कारण थे ?

Unit IV (इकाई IV)

8. On the outline map of Europe show Europe on the Eve of French Revolution. Also write an explanatory note.
यूरोप के रेखा-मानचित्र पर फ्रांस की क्रान्ति के समय के यूरोप को दर्शाइए । एक व्याख्यात्मक टिप्पणी भी लिखिए ।
9. On the outline map of world show polarization of countries before World War-II. Also write an explanatory note.
विश्व के रेखा-मानचित्र पर द्वितीय विश्वयुद्ध से पूर्व देशों का ध्रुवीकरण दर्शाइए । एक व्याख्यात्मक टिप्पणी भी लिखिए ।

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ECONOMICS

Sectoral Aspects of Indian Economy

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all. selecting at least *one*

question from each Unit. Q. No. **1** is compulsory. All

questions carry equal marks.

प्रत्येक इकाई से एक प्रश्न चुनते हुए कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

1. (a) Fill in the blanks with appropriate words : $8 \times 2 = 16$

(i) Land development banks provide.....credit to farmers. (short term, long term)

(ii) The basic cause of pollutions is..... (Political forces, Economic forces)

(iii) Sex-ratio in Haryana is the.....among all the States of India. (best, worst)

उचित शब्दों से रिक्त स्थान भरिए :

(i) भूमि विकास बैंक किसानों को..... ऋण देता है । (अल्प कालीन, दीर्घ कालीन)

(ii) प्रदूषण का मूल कारण..... है ।

(राजनीतिक शक्तियाँ, आर्थिक शक्तियाँ)

(iii) हरियाणा में लिंग अनुपात भारत के सब राज्यों में..... है । (सबसे अच्छा, सबसे बुरा)

(b) State whether the following statements are True or

False :

(i) In India, green revolution started in 1967-68.

(ii) Indian Economy is a socialistic economy.

(iii) Land reforms have not benefitted Indian agriculture.

बताइये कि निम्नलिखित कथनों में से कौनसा सत्य या असत्य है ?

(i) भारत में हरित क्रांति 1967-68 में शुरू हुई ।

(ii) भारतीय अर्थव्यवस्था एक समाजवादी अर्थव्यवस्था है ।

(iii) भूमि सुधारों से भारतीय कृषि को लाभ नहीं पहुँचा है ।

(c) Choose the *correct* alternative :

सही विकल्प चुनिए :

(i) Which of the following is the cause of slow progress of land reforms in India ?

(1) Incomplete land records

(2) Excessive litigation

(3) Lack of political will

(4) All of the above

भारत में भूमि सुधारों की धीमी प्रगति का कारण है :

(1) भूमि रिकॉर्डों का अपूर्ण होना

(2) अत्यधिक मुकदमेबाजी

(3) राजनीतिक इच्छा-शक्ति की कमी

(4) उपर्युक्त सभी

(ii) Human development index for different countries is calculated by :

(1) World Bank

(2) World Trade Organisation

(3) UNDP

(4) India

विभिन्न देशों के लिए मानव विकास सूचकांक की गणना किसके द्वारा की जाती है ?

(1) विश्व बैंक

(2) विश्व व्यापार संगठन

(3) यू.एन.डी.पी.

(4) भारत

Unit I (इकाई I)

2. What are the main defects of agriculture marketing in India ? Give suggestions to improve agriculture marketing.

8+8

भारत में कृषि बिक्री की मुख्य कमियाँ कौनसी हैं ? कृषि बिक्री में सुधार के लिए सुझाव दीजिये ।

3. Describe the main land reforms introduced in India after independence. 16

स्वतन्त्रता के पश्चात् भारतीय कृषि से लागू किए गए मुख्य भूमि सुधारों का वर्णन कीजिए ।

Unit II (इकाई II)

4. Describe the main features of 1991 industrial policy of Government of India. What are its main weaknesses? 10+6=16

भारत सरकार की 1991 की औद्योगिक नीति की मुख्य विशेषताओं की व्याख्या कीजिए । इसकी मुख्य कमियाँ क्या हैं ?

5. What are the main problems of Cottage and Small Scale Industries in India? Give suggestions for their rapid development. 8+8
- भारत में कुटीर व लघु उद्योगों की मुख्य समस्याएँ क्या हैं ? उनके तीव्र विकास के लिए सुझाव दीजिए ।

Unit III (इकाई III)

6. Explain the advantages and disadvantages of WTO for India. 8+8

भारत के लिए विश्व व्यापार संगठन के लाभ व हानियों की व्याख्या कीजिए ।

7. What do you mean by Balance of Payments of a country? Describe the causes of adverse balance of payments of India. 4+12

एक देश के भुगतान शेष से आपका क्या अभिप्राय है ? भारत के प्रतिकूल भुगतान शेष के कारणों की व्याख्या कीजिए ।

Unit IV (इकाई IV)

8. What are the main causes of adverse sex ratio in Haryana? Give suggestions to improve sex ratio in Haryana. 8+8
- हरियाणा में प्रतिकूल लिंग अनुपात के मुख्य कारण क्या हैं ? लिंग अनुपात को सुधारने के लिए सुझाव दीजिए ।

9. What are the main components of Fiscal Policy? Describe the main weaknesses of Fiscal Policy of Government of India. 6+10
- राजकोषीय नीति के मुख्य घटक कौनसे होते हैं ? भारत सरकार की राजकोषीय नीति की मुख्य कमियों की व्याख्या कीजिए ।

- (iv) Write down the advantages of Interval Training Method.
अन्तराल प्रशिक्षण विधि के लाभ लिखिए ।
- (v) What do you mean by continuous training method ?
निरन्तर प्रशिक्षण विधि से क्या तात्पर्य है ?
- (vi) What are the effects of stimulants on our health ?
उत्तेजकों का हमारे स्वास्थ्य पर क्या प्रभाव पड़ता है ?
- (vii) What are Levers ?
उत्तोलक क्या हैं ?
- (viii) What do you mean by Class-I lever ?
प्रथम प्रकार के उत्तोलक से क्या तात्पर्य है ?
- (ix) How does temperature affect sports training ?
तापमान किस प्रकार खेल प्रशिक्षण को प्रभावित करता है ?
- (x) Clarify the meaning of Extrinsic Motivation.
बाहरी अभिप्रेरण का अर्थ स्पष्ट कीजिए ।

Roll No.

Total Pages : 04

GSO/M-18 1720

HEALTH AND PHYSICAL EDUCATION

Time : Three Hours]

[Maximum Marks : 60

Note : Attempt Five questions in all. Select *one* question each from Units I, II, III and IV where Q. No. 9 (Unit V) is compulsory. All questions carry equal marks.
कुल पाँच प्रश्नों के उत्तर दीजिए । इकाई I, II, III तथा IV से एक-एक प्रश्न का उत्तर दीजिए, जबकि प्रश्न संख्या 9 (इकाई V) अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Unit I (इकाई I)

1. Clarify the meaning of Socialization. Does regular participation in games and sports promote socialization ?
Clarify:
समाजीकरण का अर्थ स्पष्ट कीजिए । क्या खेलों में नियमित रूप से भाग लेने में समाजीकरण को बढ़ावा मिलता है ? स्पष्ट कीजिए ।
2. Elucidate the effects of social behaviour on the performance of Sportspersons.
सामाजिक व्यवहार का खिल्लाड़ियों के प्रदर्शन पर पड़ने वाले प्रभावों की व्याख्या कीजिए ।

Unit II (इकाई II)

3. What is circuit training method ? Elucidate its types, characteristics and advantages.
परिधि प्रशिक्षण विधि क्या है ? इसके प्रकारों, विशेषताओं व लाभों का उल्लेख कीजिए ।
4. What do you mean by Doping ? Explain the types of doping in detail.
डोपिंग से क्या तात्पर्य है ? डोपिंग के प्रकारों का विस्तृत वर्णन कीजिए ।

Unit III (इकाई III)

5. What is Sports Biomechanics ? Is biomechanics helpful for getting apex performance in sports and games ? Explain.
खेल जीव-यांत्रिकी क्या है ? क्या खेलों में उच्च प्रदर्शन के लिए जीव-यांत्रिकी सहायक है ? वर्णन कीजिए ।
6. Elaborate the Newton's laws of motion. Are these laws applicable in games and sports ? Clarify.
न्यूटन के गति के नियमों का वर्णन कीजिए । क्या खेलकूद में इन नियमों का प्रयोग होता है ? स्पष्ट कीजिए ।

Unit IV (इकाई IV)

7. What do you mean by Digestion ? Explain the effects of exercises on digestive system in detail.
पाचन क्रिया से आप क्या समझते हैं ? व्यायाम के पाचन संस्थान पर पड़ने वाले प्रभावों का विस्तृत वर्णन कीजिए ।
8. Explain the structure of various organs of digestive system in detail.
पाचन संस्थान के विभिन्न अंगों की संरचना का सविस्तार वर्णन कीजिए ।

Unit V (इकाई V)

Compulsory Question (अनिवार्य प्रश्न)

9. (i) Define Motivation.
अभिप्रेरण को परिभाषित कीजिए ।
- (ii) How is motivation helpful in learning sports activity ?
अभिप्रेरण खेल क्रिया को सीखने में किस प्रकार सहायक है ?
- (iii) Intrinsic motivation is more effective than extrinsic motivation. Explain.
बाहरी अभिप्रेरण की अपेक्षा आन्तरिक अभिप्रेरण अधिक प्रभावी होता है ? वर्णन कीजिए ।

Roll No.

Total Pages : 03

GSO/M-1E 1722

MUSIC VOCAL

Paper I (Theory)

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

प्रत्येक इकाई से एक प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । सभी प्रश्नों के अंक समान हैं ।

Section A (खण्ड 'अ')

1. Write down the detailed description of Raga Bihag with two Alaps and two Tanas. 8

राग बिहाग का सम्पूर्ण परिचय दो आलाप और दो तानों सहित लिखिए ।

2. Give the notation of Slow Khyal of any Raga with one Alap and one Tana from your syllabus. 8
अपने पाठ्यक्रम में से किसी एक राग के विलम्बित ख्याल की स्वरलिपि एक आलाप और एक तान सहित लिखिए ।

3. Write down Teental and Jhaptaal with Dugun, Tigun and Chaugun Layakaries. 8
तीनताल तथा झपताल दुगुन, तिगुन तथा चौगुन लयकारियों सहित लिखिए ।

4. Give the notation of Raga Deshkar for Fast Khyal with two Alaps and two Tanas. 8
राग देशकार के द्रुत ख्याल की स्वरलिपि दो आलाप तथा दो तानों सहित लिखिए ।
5. Give short introduction of Raga Bahar and Raga Miyan Ki Mahar with one Alap and one Tana. 8
राग बहार तथा राग मियां की मल्हार का संक्षिप्त परिचय एक आलाप तथा एक तान सहित लिखिए ।

Section B (खण्ड 'ब')

6. Give the detailed historical study of Indian Music from 17th to 19th century. 8
17वीं से 19वीं शताब्दी तक भारतीय संगीत के इतिहास की विस्तृत व्याख्या कीजिए ।
7. Write in detail about voice culture. 8
कंठ साधना के विषय में विस्तारपूर्वक लिखिए ।
8. Give the contributions towards Indian Music by Krishan Rao Shankar Pandit. 8
कृष्ण राव शंकर पंडित जी के संगीत के क्षेत्र में योगदान की व्याख्या कीजिए ।

Section C (खण्ड 'स')

9. What do you know about Folk-Music ? Write down about folk music of Haryana and Punjab. 8
लोक संगीत के विषय में आप क्या जानते हैं ? पंजाब तथा हरियाणा के लोक संगीत के विषय में वर्णन कीजिए ।
10. Give in detail about the classification of instruments during the medieval period and modern period. 8
मध्य तथा आधुनिक समय में वाद्यों का वर्गीकरण किस प्रकार से किया गया ? इस विषय में विस्तारपूर्वक व्याख्या कीजिए ।

Roll No.

Total Pages : 03

GSO/M-18

1724

MUSIC INSTRUMENTAL

(Theory)

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

प्रत्येक इकाई से कम से कम एक प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । सभी प्रश्नों के अंक समान हैं ।

Unit I (इकाई I)

1. Write the notation of Maseethkani Gat from your syllabus in any Raag. Write four Toras in it and two Alaps with Aaroh, Avroh and Pakar. 8

अपने पाठ्यक्रम में से निर्धारित रागों के आधार पर किसी एक राग की मसीतखानी गत उसके चार तोड़े, दो आलाप आरोह, अवरोह तथा पकड़ सहित लिखिए ।

2. Write the comparative study of the following Raags : 4+4=8

(i) Bihag (ii) Kamod

निम्नलिखित रागों का तुलनात्मक अध्ययन लिखिए :

(i) बिहग (ii) कामोद

3. Write the notation of Razakhani Gat in Raag Bahar with full description. 8
अपने पाठ्यक्रम में से राग बहार की रजाखानी गत पूर्ण परिचय सहित लिखिए ।

Unit II (इकाई II)

4. Write the notation system. Explain its merits and demerits. 8
स्वरलिपि पद्धति के विकास, उसके गुण तथा दोष लिखिए ।
5. Write the development of Indian classical music in detail during 17th to 19th century. 8
17वीं से 19वीं शताब्दी तक हिन्दुस्तानी शास्त्रीय संगीत के विकास को स्पष्ट कीजिए ।

6. Write Igun, Dugun, Tigun, Chaugun in Dhamar and Sultaal. 8
धमार ताल तथा सूलताल की इगुन, दुगुन, तिगुन तथा चौगुन लिखिए ।

Unit III (इकाई III)

7. Write the contribution of Ustad Vilayat Khan in promoting music. 8
उस्ताद विलायत खाँ जी के जीवन पर प्रकाश डालते हुए उनके सांगीतिक योगदान को स्पष्ट कीजिए ।

8. Explain and write the role of Electronic media in popularising Indian classical music. 8
भारतीय शास्त्रीय संगीत के विकास में इलेक्ट्रॉनिक मीडिया का क्या योगदान है ? लिखिए ।

9. Write the historical development of Raag Bhimpalasi with its full description. 8
राग भीमपलासी का ऐतिहासिक विकास के साथ इसका पूर्ण परिचय लिखिए ।

10. Write the contribution of Ustad Ali Akbar Khan. 8
उस्ताद अली अकबर खाँ का योगदान लिखिए ।

Roll No.

Total Pages : 03

GSO/M-18

1725

MUSIC

Paper I (Theory)

Instrumental (Sitar)

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

प्रत्येक इकाई से कम से कम एक प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । सभी प्रश्नों के अंक समान हैं ।

Unit A (इकाई A)

1. Give detailed description of the following Ragas : 8

(i) Khamod (ii) Bahar

निम्नलिखित रागों का परिचय विस्तार से लिखिए :

(i) कामोद (ii) बहार

2. Write the notation of Maseetkhani Gat with two Todas in any Raga from your prescribed syllabus. 8

अपने पाठ्यक्रम के किसी भी राग में मसीतखानी गत दो तोड़ों सहित स्वरलिपिबद्ध कीजिए ।

3. Write the notation of Maseetkhani Gat in Raga Bhimpalasi with full description of same Raga. 8
 रा. भीमपलासी का परिचय देते हुए इसको मसीतखानी गत में स्वरलिपिबद्ध कीजिए ।
4. Give full detail of a Tala from prescribed your syllabus with Thah and Tigan Laya. 8
 अपने पाठ्यक्रम में दी गई किसी ताल का परिचय देते हुए इसका तह और तिगुन लिखिए ।

Unit B (इकाई B)

5. Write the merits and demerits of notation system. 8
 संगीत में स्वरलिपि पद्धति के गुण-दोष लिखिए ।
6. Write in detail on development of Indian classical music from 17th to 19th century. 8
 सत्रहवीं सदी से उन्नीसवीं सदी तक भारतीय शास्त्रीय संगीत विकास क्रम के बारे में विस्तार से लिखिए ।
7. Write your own words about any two Sitarist who were born during 17th to 19th century. 8
 सत्रहवीं सदी से उन्नीसवीं सदी तक के काल में पैदा हुए कोई दो सितार वादकों के बारे में अपने शब्दों में वर्णन कीजिए ।

Unit C (इकाई C)

8. What is the role of Ali Akbar Khan in the promoting of music ? Write your own words. 8
 अली अकबर खान का संगीत को बढ़ावा देने में क्या भूमिका है ? विस्तार से बताइए ।
9. Write about the life and contribution toward music of Ustad Vilayat Khan. 8
 उस्ताद विलायत खान की जीवनी एवं संगीत में दिए अतुलनीय योगदान को अपने शब्दों में वर्णन कीजिए ।
10. What is the role of electronic media in popularizing Indian classical music ? Describe in detail. 8
 भारतीय शास्त्रीय संगीत को बढ़ावा देने में इलेक्ट्रॉनिक मीडिया की क्या भूमिका है ? विस्तार से बताइए ।

Roll No.

Total Pages : 03

GSO/M-18 1733

OFFICE MANAGEMENT

Computer Applications in Office Management

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt any *Five* questions.

किन्हीं पाँच प्रश्नों के उत्तर दीजिए ।

1. (a) Differentiate between Primary and Secondary Storage of Computer System. 6
प्राथमिक और माध्यमिक स्टोरेज प्रणाली के बीच अंतर स्पष्ट कीजिए ।
- (b) What are two main components of CPU ? Also explain functions of each unit. 10
CPU के दो मुख्य घटक क्या हैं ? प्रत्येक इकाई के कार्य की व्याख्या भी कीजिए ।
2. Compare different Networks—LAN, WAN and MAN using suitable examples. 16
विभिन्न नेटवर्क—LAN, WAN और MAN की उपयुक्त उदाहरणों का प्रयोग करते हुए तुलना कीजिए ।

3. Define Operating System and also explain its types and uses. 16
ऑपरेटिंग सिस्टम को परिभाषित कीजिए तथा इसके प्रकार और उपयोगों को समझाइए ।
4. (a) How can we create a Table in Word Processing ? 8
शब्द संसाधन में हम एक तालिका कैसे बना सकते हैं ?
(b) Define Macro. Explain the steps to create Macro in word Processing. 8
Macro को परिभाषित कीजिए । शब्द संसाधन में Macro बनाने के लिए चरणों को समझाइए ।
5. Explain the concept of Online Data Processing in detail with suitable example. 16
ऑनलाइन डाटा प्रोसेसिंग की अवधारणा की व्याख्या उपयुक्त उदाहरण के साथ विस्तार से बताइये ।
6. What is Database Management System ? Also explain main components of Database Management System in detail. 16
डेटाबेस प्रबंधन प्रणाली क्या है ? डेटाबेस प्रबंधन प्रणाली के मुख्य घटकों को विस्तार से बताइये ।
7. What is Topology ? Also explain different Network topologies in detail. 16
टोपोलॉजी क्या है ? इसके अतिरिक्त विभिन्न नेटवर्क टोपोलॉजी को विस्तार से समझाइये ।

8. Write short notes on the following :
(i) Application Software (ii) System Software. 2×8
निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :
(i) Application Software (ii) System Software.
9. What is Multimedia ? What are the components used for it ? Explain with example. 16
मल्टीमीडिया क्या है ? इसके लिए प्रयोग होने वाले घटक क्या हैं ? उदाहरण सहित समझाइए ।
10. Explain the following terms : 4×4
(i) Field
(ii) Master Key
(iii) Primary Key
(iv) Report and Form Generation.
निम्नलिखित टर्म्स की व्याख्या कीजिए :
(i) फील्ड
(ii) मास्टर कुंजी
(iii) प्राथमिक कुंजी
(iv) रिपोर्ट तथा प्रपत्र जनरेशन की व्याख्या ।

Roll No.

Total Pages : 03

GSO/M-18 1740

COMPARATIVE CONSTITUTIONS IN
U.K. & U.S.A.
Option (i)

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. 9 is compulsory. All questions carry equal marks.
प्रत्येक इकाई से एक प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 9 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Unit I (इकाई I)

1. Explain the Legacies in U.S.A.
अमेरिकन विरासतों की व्याख्या कीजिए । 16
2. Basic features of U.K. Constitution.
इंग्लैंड के संविधान की विशेषताएँ बताइये ।

Unit II (इकाई II)

3. What is the Justification on Monarchy in U.K. 16
इंग्लैंड में राजतंत्र का क्या औचित्य है ?

4. American Senate is the most powerful second Chamber in the world. Examine.
अमेरिकन सीनेट विश्व का सबसे शक्तिशाली दूसरा सदन है ।
व्याख्या कीजिए ।

Unit III (इकाई III)

5. Describe the role of pressure groups in UK. 16
इंग्लैंड में दबाव समूहों की भूमिका का वर्णन कीजिए ।
6. Explain the Political Parties in U.S.A.
अमेरिकन राजनैतिक दलों पर टिप्पणी लिखिए ।

Unit IV (इकाई IV)

7. Explain the Electoral Process in U.K. 16
इंग्लैंड की चुनाव प्रक्रिया स्पष्ट कीजिए ।
8. What is the voting behaviour in U.S.A. ?
अमेरिका में मतदान व्यवहार पर टिप्पणी लिखिए ।

Unit V (इकाई V)

9. Write short notes on the following : 2×8=16
(i) First President of U.S.A.
(ii) Name of main two Political Parties of U.K.
(iii) Two functions of Bureaucracy.
(iv) Two merits of Bicameral Legislature.

- (v) Two basic features of U.S.A. Constitution.
(vi) Short answer of theory of Checks and Balances in U.S.A.
(vii) Briefly explain the Supreme Court of U.K.
(viii) Election procedure in U.K.
निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :
- (i) अमेरिका के पहले राष्ट्रपति का नाम बताइये ।
(ii) इंग्लैंड के दो मुख्य राजनैतिक दलों के नाम बताइये ।
(iii) नौकरशाही के दो कार्य बताइये ।
(iv) द्वितीय सदनीय विधानमंडल के दो गुण
(v) अमेरिकन संविधान की दो विशेषतायें ।
(vi) अमेरिका में अवरोध व सन्तुलन सिद्धान्त का अर्थ ।
(vii) इंग्लैंड के सर्वोच्च न्यायालय पर एक संक्षिप्त टिप्पणी लिखिए ।
(viii) इंग्लैंड की चुनाव प्रक्रिया ।

(vii) Political System of England :

- (a) Federal (b) Unitary
(c) Presidential (d) None of these
इंग्लैण्ड की शासन प्रणाली :

- (अ) संघात्मक (ब) एकात्मक
(स) अध्यक्षतात्मक (द) इनमें से कोई नहीं

(viii) Barak Obama belongs to :

- (a) Republic Party (b) Democratic
(c) Labour Party (d) None of these
बराक ओबामा का सम्बन्ध है :
(अ) रिपब्लिकन पार्टी से (ब) डेमोक्रेटिक से
(स) लेबर पार्टी से (द) इनमें से कोई नहीं

Roll No.

Total Pages : 04

GSO/M-18 1741

POLITICAL SCIENCE

Paper : 1 (Option (i))

Comparative Constitution of U.K & U.S.A.

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt any *five* questions.

किसी पाँच प्रश्नों के उत्तर दीजिए ।

1. Main features of U.K. or U.S.A. Constitution. 16
इंग्लैंड या अमेरिका के राजविधान की प्रमुख विशेषताएँ ।
2. Justification of Monarchy in England. 16
इंग्लैंड में राजतंत्र का क्या औचित्य है ?
3. Describe the organisation and powers of the American Senate. 6,10
अमेरिकन सेनेट की शक्तियाँ और संरचना बताइये ।
4. Lord Sabha of England is not only the Second Chamber but Secondary Chamber. Explain. 16
इंग्लैंड का लॉर्ड्स सदन दूसरा सदन ही नहीं बल्कि दूसरे दर्जे का सदन है । स्पष्ट कीजिए ।

5. Comparison between the powers of British P.M. with American President. 8+8

इंग्लैण्ड के प्रधान मंत्री की अमेरिकन राष्ट्रपति से तुलना कीजिए ।

6. What is the voting behaviour in England and America ? 8+8
इंग्लैड और अमेरिका में मतदान व्यवहार पर नोट लिखिए ।

7. Write a note on the Party System of U.S.A. 8+8
अमेरिकन दलीय प्रणाली पर नोट लिखिए ।

8. What do you mean by Pressure Groups in U.K. ? 8+8
इंग्लैण्ड के दबाव समूहों से आपका क्या अभिप्राय है ?

9. Objective Type Questions : 8×2
बहुविकल्पीय प्रश्न :

(i) Chairman of Commons Sabha :

(a) Speaker (b) P.M.

(c) King (d) None of these

कॉमन सभा का अध्यक्ष :

(अ) स्पीकर (ब) प्रधान मंत्री

(स) राजा (द) इनमें से कोई नहीं

(ii) British Constitution :

(a) Flexible (b) Rigid

(c) Rigid & Flexible (d) None of these

इंग्लैण्ड का संविधान :

(अ) लचीला (ब) कठोर

(स) कठोर तथा लचीला (द) इनमें से कोई नहीं

(iii) Tenure of Commons Sabha :

(a) 4 years (b) 5 years

(c) 6 years (d) None of these

कॉमन सभा का कार्यकाल :

(अ) 4 वर्ष (ब) 5 वर्ष

(स) 6 वर्ष (द) इनमें से कोई नहीं

(iv) American Political System :

(a) Federal (b) Unitary

(c) Parliamentary (d) Monarchy

अमेरिकन शासन प्रणाली :

(अ) संघात्मक (ब) एकात्मक

(स) संसदीय (द) राजतंत्र

(v) Tenure of American President :

(a) 4 years (b) 8 years

(c) 2 years (d) 10 years

अमेरिकन राष्ट्रपति का कार्यकाल :

(अ) 4 वर्ष (ब) 8 वर्ष

(स) 2 वर्ष (द) 10 वर्ष

(vi) Party System in England :

(a) Single (b) Double

(c) Multy (d) None of these

इंग्लैड की दलीय व्यवस्था :

(अ) एकदलीय (ब) द्विदलीय

(स) बहुदलीय (द) इनमें से कोई नहीं

(b) For what values of z , the function :

$$z = \sinh u \cos v + i \cosh u \sin v$$

ceases to be analytic.

2½

7. (a) Find the regular function whose imaginary part is :

$$V = \frac{x-y}{x^2+y^2}$$

- (b) If $u+v = \frac{\sin 2x}{\cosh 2y - \cos 2x}$ and $f(z) = u + iv$ is an analytic function of z , then find $f(z)$ in terms of z .

2½

Section IV

8. (a) Find the image of $|z - 3i| = 3$ under the mapping

$$w = \frac{1}{z}$$

2½

- (b) Find the fixed points, normal form and nature of the following Mobius transformation $w = \frac{3z-u}{z-1}$.

2½

9. (a) Show that cross-ratio remains invariant under mobius transformation.

2½

- (b) Find the region of the w -plane into which the region $\frac{1}{2} \leq x \leq 1$ and $\frac{1}{2} \leq y \leq 1$ is mapped by the transformation $w = z^2$.

2½

Roll No.

Total Pages : 04

GSO/M-18

1744

REAL AND COMPLEX ANALYSIS

BM-361

Time : Three Hours]

[Maximum Marks : 27

Note : Attempt *Five* questions in all, selecting at least *one* question from each Section. Q. No. 1 is compulsory.

(Compulsory Question)

1. (a) Show that :

1½

$$\int_{-\infty}^0 e^{-x^2} dx = \frac{\sqrt{\pi}}{2}$$

- (b) Change the order of integration of :

1½

$$\int_0^a \int_0^{\sqrt{2ay-y^2}} f(x, y) dx dy$$

- (c) Find K such that the function :

$$f(z) = r^2 \cos 2\theta + ir^2 \sin K\theta$$

1½

- (d) Find the fixed points of the following mobles transformation :

1

$$W = \frac{3iz+1}{z+i}$$

L-1744

4

4,500

(3-07/12)L-1744

P.T.O.

- (e) Define Fourier series for Even and Odd functions defined in the interval $[-\pi, \pi]$. 2½

Section I

2. (a) Prove that the functions :

$$u = \sin^{-1} x + \sin^{-1} y, \quad v = x\sqrt{1-y^2} + y\sqrt{1-x^2}$$

are functionally dependent. Also find the relation between them. 2½

- (b) Show that :

$$B(m, n) = \frac{(m-1)!(n-1)!}{(m+n-1)!} \quad \text{if } m, n \text{ are positive integers}$$

3. (a) Evaluate $\iint_R y dx dy$ where R is the region bounded by

by the parabolas $y^2 = 4x$ and $x^2 = 4y$. 2½

- (b) Show that the volume of the tetrahedron bounded by the planes $x = 0, y = 0, z = 0$ and $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$ is $\frac{abc}{6}$. 2½

Section II

4. (a) Find the Fourier series (or Expansion) for the function $f(x) = |x| - \pi \leq x \leq \pi$. Also deduce that : 2½

$$\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots = \frac{\pi^2}{8}$$

- (b) Obtain the Fourier expansion for $f(x)$, if : 2½

$$f(x) = \begin{cases} -\pi & -\pi < x < 0 \\ x & 0 < x < \pi \end{cases}$$

5. (a) Prove that :

$$\int_C^{C+2l} [f(x)]^2 dx = l \left[\frac{1}{2} a_0^2 + \sum_{n=1}^{\infty} (a_n^2 + b_n^2) \right]$$

provided the Fourier series for $f(x)$ converges uniformly in $(C, C + 2l)$. 2½

- (b) Find the half-range cosine series for $f(x) = x(\pi - x)$ in the interval $(0, \pi)$. 2½

Section III

6. (a) If a function $f(z) = u(x, y) + iv(x, y)$ is differentiable at the point $z_0 = x_0 + iy_0$ in a domain D, then prove that the four partial derivatives u_x, u_y, v_x and v_y exist at (x_0, y_0) and satisfy the equations : 2½
- $u_x = v_y$ and $u_y = -v_x$.

9. (a) Let T be a linear operator on an inner product space $V(F)$. Then prove that T^* exists and $TT^* = T^*T = I$ iff T is unitary. 3

(b) Let T be a self adjoint operator on a finite dimensional inner product space V . Show that $\|T\|$ is real. 2

Roll No.

Total Pages : 04

GSO/M-18

1745

LINEAR ALGEBRA

BM-362

Time : Three Hours]

[Maximum Marks : 25

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. **1** is compulsory.

Compulsory Question

1. (a) For what value of k will the vector $u = (1, k, 5)$ in $V_3(R)$ be a linear combination of vectors $v = (1, -3, 2)$ and $w = (2, -1, 1)$. 2
- (b) Show that the transformation $T : R^3 \rightarrow R^2$ defined by $T(x_1, x_2, x_3) = (x_1, x_2)$ is linear and is onto but not one-one. 2
- (c) Define the self-adjoint operator.
- (d) Define characteristic polynomial of a linear transformation. 1

Unit I

2. (a) If W_1 and W_2 are two subspaces of a finite dimensional vector space $V(F)$, then $\dim(W_1 + W_2) = \dim W_1 + \dim W_2 - \dim(W_1 \cap W_2)$. 3

- (b) Show that the set $\{(1, i, 0), (2i, 1, 1), (0, 1+i, 1-i)\}$ is a basis of $V_3(C)$. 2

Unit III

6. (a) If the matrix of a L.T.T. on R^3 relative to the ordered basis $B = \{(1, 0, 0), (0, 1, 0), (0, 0, 1)\}$ is
- $$\begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & -1 \\ -1 & -1 & 0 \end{bmatrix}; \text{ find the matrix of } T \text{ relative to the basis } B' = \{(0, 1, -1), (-1, 1, 0), (1, -1, 1)\}. \quad 3$$
- (b) Find the co-ordinates of the vector $v = (1, 0, 1)$ relative to the basis $Y_1 = (1, 1, 2), Y_2 = (2, 2, 1), Y_3 = (1, 2, 2)$. 2
7. (a) If T is an invertible operator and λ is an eigen value of T , then prove λ^{-1} is an eigen value of T^{-1} . 3
- (b) Let $T : R^3(R) \rightarrow R^2(R)$ be a L.T. $T(x, y, z) = (2x-y, x+y+z, 2z)$ find the characteristic and minimal polynomial for T . 2

Unit II

- (b) Show that the subspace spanned by the vectors $V_1 = (1, 2, 1), V_2 = (1, 2, 3)$ and the subspace spanned by the vectors $W_1 = (0, 0, 1)$ and $W_2 = (1, 2, 5)$ are identical. 2
- (a) If $T : U(F) \rightarrow V(F)$ is a L.T. show that $N(T)$ is a subspace of $U(F)$. 3
- (b) Find a LIT $: R^3 \rightarrow R^4$ where null space is generated by $(0, 1, -3), (0, -3, 4)$. 2

Unit IV

- (a) Prove that dual space V^* of a n -dimensional vector space $V(F)$ is also n -dimensional. 3
- (b) Let f be a linear functional on R^2 defined by $f(2, 1) = 15$ and $f(1, -2) = -10$. Find : 2
- $$f(x, y) \quad \forall (x, y) \in R^2.$$

8. (a) Let $V(F)$ be a inner product space. If $u, v \in V$ s.t.

$\|u, v\| = \|u\| \cdot \|v\|$, show that u and v are linearly dependent. 3

- (b) Obtain the orthonormal basis w.r.t. the standard inner product for the subspace of R^3 generated by $(1, 0, 1), (1, 0, -1)$ and $(0, 3, 4)$. 2

- (b) If R is the maximum range on an inclined plane through the projection of a particle and T the corresponding time of flight, show that $R = \frac{1}{2} g T^2$.

3

Unit IV

8. (a) Find the differential equation of central orbit in pedal form. 2½

- (b) If a particle is projected from an apse at a distance 'a' with velocity from infinity, under the action of central force $m r^{-7}$, prove that the orbit is $r^2 = a^2 \cos 2\theta$. 3

9. (a) A particle moves in a plane under a central force which varies inversely as the square of the distance from the fixed point. Find the orbit. 2½

- (b) A particle moves on a smooth sphere under no forces except the pressure of the surface, show that its path is given by the equation $\cot \theta = \cot \beta \cos \phi$, where θ and ϕ are its angular co-ordinates. 3

Roll No.

Total Pages : 04

GSO/M-18 1746

DYNAMICS

BM-363

Time : Three Hours]

[Maximum Marks : 27

Note : Attempt Five questions in all, selecting at least one question from each Unit. Q. No. 1 is compulsory.

Compulsory Question

1. (a) Define Radial and Transverse Velocities. 1
- (b) State and prove Newton's second law of motion. 1
- (c) Find the uniform force that will move 1 kg. mass from rest through 1 metre in 1 second. 1½
- (d) Define time of flight and horizontal range of a projectile. 1
- (e) Define Apse and Apsidal distances. 1

Unit I

2. (a) A particle moves along a circle $r = 2a \cos \theta$ in such a way that its acceleration towards the origin is always zero. Prove that : 2½

$$\frac{d^2\theta}{dt^2} = -2 \cot \theta \left(\frac{d\theta}{dt} \right)^2$$

- (b) A ship is sailing due west and the apparent direction of the wind as shown by the fluttering of the flag on the mast is from the north. The wind is known to be blowing from a point 30° east of north. Show that its velocity is double that of the ship. 3
3. (a) A particle moving with SHM of period 12 seconds travels 10 cms. from the position of rest in 2 secs. Find the amplitude, the maximum velocity and the velocity at the end of 2 seconds. $2\frac{1}{2}$
- (b) Prove that the work done against the tension in stretching a light elastic string is equal to the product of its extension and the mean of the initial and final tensions. 3

Unit II

4. (a) An engine and the train weigh 200 tons and the engine exert a pull of $3\frac{1}{2}$ tons. The resistance to the motion of train is 14 lbs. wt. per ton. Find the time the train will take to acquire a velocity of 30 m.p.h. from rest. $2\frac{1}{2}$
- (b) A bucket of water weighing 160 lbs. is being raised from a well 100 ft. deep with a uniform force of 200 lbs. wt. With what acceleration will it move and what time does it take to reach the top of the well. 3

5. (a) Two heavy particles are attached together by a string passing over a pulley. If the string can only support a tension equal to one quarter of the sum of the weights at its two ends, show that the least acceleration possible is $\frac{g}{\sqrt{2}}$. $2\frac{1}{2}$
- (b) Show that if mass m is allowed to slide down a smooth inclined plane, the sum of potential and kinetic energies at every instant is the same. 3

Unit III

6. (a) If a particle starts from rest at a depth $\frac{r}{2}$ below the highest point of a smooth vertical circle of radius r , prove that it will leave the circle at a distance $\frac{r}{3}$ above the centre. $2\frac{1}{2}$
- (b) A particle is placed very close to the vertex of a smooth cycloid whose axis is vertical and vertex upwards and is allowed to run down the curve. Discuss its motion. 3
7. (a) A cannon ball has a range R on a horizontal plane. If H and H' are greatest heights and t, t' the times of flight in the two possible paths show that
- $$R = \sqrt{H H'} = \frac{1}{2} g t t' \quad 2\frac{1}{2}$$

(22)

(b) Prove that an analytic function with constant modulus is constant. 4

7. (a) Show that $u(x, y) = e^{-x}(x \sin y - y \cos y)$ is harmonic and find $v(x, y)$ such that $f(z) = u + iv$ is analytic. 4

(b) If $f(z) = u + iv$ is an analytic function of z , find $f(z)$ if $u - v = (x - y)(x^2 + 4xy + y^2)$. 4

Section IV

8. (a) Show that the transformation $w = \frac{1}{z}$ maps a circle in z -plane to a circle in w -plane or to a straight line if the circle in z -plane passes through the origin. 4

(b) Find the bilinear transformation which maps the points $z = 1, i, -1$ into the points $w = i, 0, -i$. Hence find the image of $|z| < 1$. 4

9. (a) Find the image of regions inside and outside the unit circle under the transformation $w = \frac{iz + 1}{z + i}$. 4

(b) Find the Mobius transformation which maps $R(z) \geq 0$ into the unit circle $|w| \leq 1$.

Roll No.

Total Pages : 04

GSQ/M-18 1763

REAL AND COMPLEX ANALYSIS

BM-361

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt Five questions in all, selecting at least one question from each Section. Q. No. 1 is compulsory.

Compulsory Question

1. (a) Evaluate : 2

$$\int_0^{\pi} (8 - x^2)^{-1/2} dx$$

(b) Change the order of integration of : 2

$$\int_a^b \int_{\sqrt{a^2 - x^2}}^{\sqrt{b^2 - x^2}} f(x, y) dx dy$$

(c) Find the Fourier co-efficient a_n for the function : 2

$$f(x) = x \text{ in } [-\pi, \pi]$$

(d) Find the invariant points of the Mobius transformation : 2

$$w = iz^2$$

Section I

2. (a) Prove that $u = e^x + \log y + xyz$, $v = \log x + e^y + xyz$ are not functionally dependent. 4

(b) Prove that : 4

$$\int_0^1 \frac{x^{m-1}(1-x)^{n-1}}{(a+x)^{m+n}} dx = \frac{\overline{(m)} \overline{(n)}}{a^n (1+a)^m \overline{(m+n)}}$$

3. (a) Evaluate $\iiint_V z(x^2 + y^2) dx dy dz$ where : 4

$$V = \{(x, y, z) : 2 \leq z \leq 3, x^2 + y^2 \leq 1\}$$

(b) Evaluate : 4

$$\iiint_R (x+y+z+1)^2 dx dy dz$$

where R is the region defined by
 $x \geq 0, y \geq 0, z \geq 0, x+y+z \leq 1$.

Section II

4. (a) Find the Fourier series expansion of $f(x) = x \sin x$ in $[-\pi, \pi]$. 4

(b) Find the Fourier series expansion for the function : 4

$$f(x) = \begin{cases} \frac{x+\pi}{2}, & -\pi < x < 0 \\ \frac{\pi-x}{2}, & 0 < x < \pi \\ 0, & x = 0, \pm\pi \end{cases}$$

5. (a) Obtain Fourier series for the function : 4

$$f(x) = \begin{cases} \pi x, & 0 \leq x \leq 1 \\ \pi(2-x), & 1 \leq x \leq 2 \end{cases}$$

(b) Find the half range cosine series for $f(x) = x(\pi-x)$ in $(0, \pi)$. Also deduce that : 4

$$\frac{1}{1^3} + \frac{1}{3^3} + \frac{1}{5^3} + \dots = \frac{\pi^3}{32}$$

Section III

6. (a) Show that the function :

$$f(z) = \frac{x^2 y^5 (x+iy)}{x^4 + y^{10}}, \quad z \neq 0$$

$$= 0, \quad z = 0$$

is continuous and that C-R equations are satisfied at the origin, yet $f'(0)$ does not exist. 4

- (b) If $\{u_1, u_2, \dots, u_n\}$ is an orthonormal basis of an inner product space V and $u \in V$ be arbitrary, then the co-ordinates of u relative to the basis $\{u_i\}$ are

$$\langle u, u_i \rangle \text{ and } \|u\|^2 = \sum_{i=1}^n \langle u, u_i \rangle^2.$$

4

9. (a) Let f be a linear functional on a finite dimensional inner product space $V(F)$. Then there exists a unique vector $v \in V$ such that $f(u) = \langle u, v \rangle$ for all $u \in V$.

4

- (b) Let T be a linear operator on a unitary space $V(C)$. Prove that $T = 0$ iff $\langle T(\alpha), \alpha \rangle = 0$ for all $\alpha \in V$.

4

Roll No.

Total Pages : 04

GSO/M-18 1764

LINEAR ALGEBRA

BM-362

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory.

(Compulsory Question)

1. (a) -Define basis of a vector-space. 1½
- (b) The union of two subspaces of a vector-space $V(F)$ may not be a subspace of $V(F)$, give example. 2
- (c) State Rank-Nullity theorem. 1½
- (d) Find the norm of the vector $u = (2, -3, 6)$ and normalize this vector. 1½
- (e) Define orthogonal complement of a subspace W of V . 1½

Unit I

2. (a) A necessary and sufficient condition for a non-empty subset W of a vector space $V(F)$ to be a subspace of V is that W is closed under addition and scalar multiplication. 4

(b) Find the basis and dimension of the sub-space W

generated by the set of vectors :

$S = \{(1, -1, 1), (8, 4, 2), (2, 2, 0), (3, 9, -3)\}$ of \mathbf{R}^3 . Also extend this basis to get a basis of \mathbf{R}^3 . 4

3. (a) If S is linearly independent and $V \notin S$, then the set $S \cup \{V\}$ is linearly independent. 4

(b) If W is a subspace of a vector space $V(F)$ and $u, u' \in V$, then $W + u = W + u'$ iff $u - u' \in W$. 4

Unit II

4. (a) Let $T : U \rightarrow V$ be a linear transformation. Then $U/\ker T \cong T(U)$. 4

(b) Find a linear transformation $T : \mathbf{R}^3 \rightarrow \mathbf{R}^3$ whose range space is spanned by the vectors $(1, 2, 3), (4, 5, 6)$. 4

5. (a) Show that the transformation $T : \mathbf{R}^3 \rightarrow \mathbf{R}^2$ defined by $T(x_1, x_2, x_3) = (x_1, x_2)$ is a linear transformation and is onto but not one to one. 4

(b) Let $u_1 = (1, 1), u_2 = (0, 1)$ be a basis of \mathbf{R}^2 . Let $T : \mathbf{R}^2 \rightarrow \mathbf{R}$ be the linear transformation for which $T(u_1) = 3$ and $T(u_2) = -2$. Find the linear transformation T . 4

Unit III

6. (a) If $T_1 : U \rightarrow V$ and $T_2 : V \rightarrow W$ are two invertible linear transformations, then $T_2 T_1$ is also invertible and $(T_2 T_1)^{-1} = T_1^{-1} T_2^{-1}$. 4

(b) If the matrix of a linear operator T on \mathbf{R}^3 relative to the standard basis is $\begin{bmatrix} 1 & 1 & -1 \\ -1 & 1 & 1 \\ 1 & -1 & 1 \end{bmatrix}$, then find the

matrix of T relative to the basis $B' \{(1, 2, 2), (1, 1, 2), (1, 2, 1)\}$. 4

7. (a) Let $X = (1, 2, 1)$ be relative to standard basis. Find its co-ordinates relative to basis $\{(1, 1, 0), (1, 0, 1), (1, 1, 1)\}$ using change of basis matrix (Transition matrix). 4

(b) Let $T : V \rightarrow V$ be a linear transformation. Then $\lambda \in F$ is an eigen value of T iff $T - \lambda I$ is singular. Also, the eigen space of λ is the kernel of $T - \lambda I$. 4

Unit IV

8. (a) Let W be a subspace of an inner product space $V(F)$. If $\{w_1, w_2, \dots, w_n\}$ is a basis of W , then $w \in W^\perp$ iff $\langle w, w_i \rangle = 0, 1 \leq i \leq n$. 4

Roll No.

Total Pages : 05

GSO/M-18 1765

DYNAMICS

BM-363

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. **9** is compulsory.

Unit I

1. (a) A particle is moving along a circle $r = 2a \sin \theta$ is such a way that its acceleration towards the origin is always zero. Show that the transverse acceleration varies as the fifth power of $\sec \theta$. 4
- (b) Prove that if tangential and normal acceleration of a particle describing a plane curve be constant throughout the motion, the angle ψ through which the direction of motion turns is given by
 $\psi = A \log[1 + Bt]$. 4

2. (a) Two particles A and B are moving along the co-centric circles of radii 2 m and 8 m respectively with constant angular velocities of 4 radian per sec. and 2 radian per sec. Obtain their relative acceleration when their angular distance apart is $\frac{2\pi}{3}$. 4
- (b) A particle starting from rest and executing S.H.M. of period 12 seconds travels 10 inches in 2 seconds. Find the amplitude, maximum velocity and the velocity at the end of 2 seconds. 4

Unit II

3. (a) Prove that the shortest time from rest to rest in which a steady load P tons can lift a weight W ton and through a vertical distance h ft is $\sqrt{\frac{2hP}{g(P-W)}}$ seconds. 4
- (b) If the string of an Atwood's machine can bear a strain of only $\frac{1}{4}$ of the sum of two weights. Show that the least possible acceleration is $\frac{g}{\sqrt{2}}$. 4

4. (a) A locomotive engine draws a load of m lbs up an incline of α to the horizon, the co-efficient of friction being μ . If starting from rest and moving with uniform acceleration it requires n velocity v in / seconds. Show that average H.P. at which the engine has worked is $\frac{mv}{1100} \left[\frac{v}{gt} + \mu \cos \alpha + \sin \alpha \right]$. 4
- (b) A mass of 10 kg falls freely a distance of 10 m from rest and is then brought to rest after penetrating through 1 m in sand. Find the average force exerted by the sand on it. 4

Unit III

5. (a) A cricket ball thrown from a height of 6 ft at an angle of 30° to the horizon with a speed of 60 ft/sec. is caught by another field man at a height 2 ft from the ground. How far apart were the two men ? 4
- (b) The angular elevation of an enemy's position on a hill h feet high is β . Show that in order to shell it, the initial velocity of the projectile must not be less than $\sqrt{gh(1 + \operatorname{cosec} \beta)}$. 4

6. The base of a rough cycloidal arc is horizontal and its vertex downwards. A bend slides along its starting from rest at the clasp and coming to rest at vertex. Show that $\mu^2 e^{\mu\pi} = 1$. 4

Unit IV

7. (a) Prove that the orbit produced by a central force is a plane curve. 4
- (b) A particle describes an ellipse under force $\frac{\mu}{r^2}$ and has a velocity v at a distance r from the centre of a force. Show that its time period is $\frac{2\pi \left[\frac{2}{r} - \frac{v^2}{\mu} \right]^{-3/2}}{\sqrt{\mu}}$. 4

8. (a) Prove that the time taken by earth to travel half its orbit remote from the sun separated by minor axis is two days more than half the year the eccentricity of orbit being $\frac{1}{60}$. 4
- (b) If v_1 and v_2 are maximum and minimum velocities of a planet, then prove that $(1 - e)v_1 = (1 + e)v_2$ for an elliptic path. 4

Unit V

(Compulsory Question)

9. (a) Prove that acceleration of a point moving in a curve with uniform speed is $\rho \left(\frac{d\psi}{dt} \right)^2$, 2
- (b) Define Hooke's Law, Newton's First Law of Motion. 2
- (c) The maximum velocity of a body moving with S.H.M. is 2 and its period is $\frac{1}{5}$. Find its amplitude. 2
- (d) Define Central Force and Central Orbit. 2

Roll No.

Total Pages : 03

GSO/M-18 1770

PHYSICS

Paper XI

Solid State and Nano Physics

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks. Non-programmable calculator is allowed.

- I.** (a) Lattice constant of a cubic lattice is ' a '. Determine the spacing between (112) and (100) planes. **2**
- (b) Define the concept of X-ray diffraction. **2**
- (c) Differentiate between type I and type II superconductors. **2**
- (d) State the principle of scanning electron microscope. **2**

Unit I

- 2.** (a) Explain crystalline and glassy materials. Write their properties. **3**

- (b) Differentiate between amorphous and crystalline solids. 3
- (c) Find the Miller indices for a plane, which intercepts the a , b and c axes at $3a$, $2b$ and $3c$. 2
3. (a) What do you mean by symmetry operations ? Describe the principle of symmetry operations applicable to a three dimensional lattice. 4
- (b) Explain diamond structure and show that it is having loose packing structure. 4

Unit II

4. (a) Explain reciprocal lattice. Derive the expression for the primitive translation vectors of the reciprocal vectors. 4
- (b) Describe the rotating crystal method and powder method used in X-ray diffraction. 4

5. (a) Write the reciprocal lattice to a simple cubic lattice and show that the reciprocal lattice is itself a simple cubic lattice with lattice constant $\frac{1}{a}$, where ' a ' is the side of the cube. 3
- (b) Explain the concept of K-space. 3
- (c) The spacing between the planes of NaCl crystal is 2.82×10^{-10} metre. The first order Bragg's reflection occurs at an angle of 30° . Find the wavelength of X-rays. 2

Unit III

6. (a) Explain Meissner effect. Prove that Meissner effect and state of zero resistivity are mutually independent to each other. 4
- (b) Explain Pippard's theory. Prove that the coherence length reduces due to the presence of impurities, in a superconductor. 4
7. (a) What is Josephson effect ? Describe d.c. and a.c. Josephson effects. 4
- (b) Discuss the applications and limitations of the superconductors. 4

Unit IV

8. (a) What is Nanotechnology ? Explain the size dependence of particles in detail. 4
- (b) Discuss the tools for the synthesis of nanostructures. 4
9. (a) Explain carbon fullerene, its synthesis and purification. 4
- (b) Discuss the different fields in which nanotechnology is used. 4

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Total Pages : 03

GSO/M-18 1771

PHYSICS

Paper XI

Ph-602 (ii)

Solid State and Nano-Physics

Time : Three Hours]

[Maximum Marks : 45

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. Non-programmable scientific calculator is allowed.

(Compulsory Question)

1. (a) What is Wigner Sieltz Primitive Cell ? 2
- (b) What are Miller indices of a plane ? 2
- (c) What are Superconductors ? Write its two applications. 2½
- (d) What are carbon nanotubes ? Explain. 2½

Unit I

2. (a) What do you mean by a lattice, basis, unit cell and primitive cell ? Discuss the Bravais lattices for a two-dimensional lattice. 6

- (b) Explain the crystal structure of diamond. Calculate its packing fraction and show that it has a comparatively loose packing. 3

3. Discuss sc, bcc and fcc structures in brief. Explain the various characteristics of the cubic crystals. (cubic unit cell). 9

Unit II

4. (a) Describe the various methods for crystal structure determined by X-ray diffraction. 7
 (b) What wavelengths in a beam containing the range 0.2 Å to 1.0 Å will be reflected, when incident at 9° upon the cube face of a rock salt crystal? Given $d = 2.814 \text{ Å}$. 2
5. (a) What do you mean by reciprocal lattice? Show that the reciprocal lattice of a bcc is fcc. 6
 (b) Prove that in a cubic crystal the direction [hkl] is perpendicular to the plane [hkl]. 3

Unit III

6. (a) Explain London theory in context of superconductivity. Derive the expressions for London equations. 6
 (b) Discuss critical magnetic field in type I and type II superconductors. 3

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2

7. Write short notes on the following :
 (a) Type I and Type II superconductors 5
 (b) Meissner effect. 4

Unit IV

8. (a) Give the definition of Nano-technology. Discuss the nano-scale and its importance. 4
 (b) Write a note on TEM. 5
9. (a) What is molecular assembler concept? Explain the self-assembly and molecular self-assembly. 5
 (b) Discuss the applications of nano-technology in the field of Nano-biotechnology. 4

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Total Pages : 03

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1772

PHYSICS-XII

Paper II

PH-602

Atomic and Molecular Spectroscopy

Time : Three Hours]

[Maximum Marks : 40

Note : Q. No. 1 is compulsory. Attempt *Four* more questions, selecting *one* question from each Unit. All questions carry equal marks. Non-programmable Scientific calculator is allowed.

(Compulsory Question)

1. (a) Can a hydrogen atom absorb photon energy greater than the binding energy of the atom ? 2
- (b) Distinguish between weak field and strong field Stark effect. 2
- (c) Give important applications of Raman Effect. 2
- (d) What are the major drawbacks of old Quantum Theory ? 2

Unit I

2. (a) Discuss the effect of nuclear motion on the spectra of hydrogen like atom. 5
 (b) Prove that velocity of Hydrogen atom in 1st Bohr's orbit is close to $1/137$ times the velocity of light. 3
3. (a) What do you understand by space quantization ? Explain the significance of magnetic quantum numbers. How are they related ? 6
 (b) An electron is made to collide with a hydrogen atom in its ground state and excites it to $n = 3$. Find the energy gained by hydrogen atom. 2

Unit II

4. (a) Discuss the theory of spin orbit interaction and derive an expression for spin orbit interaction energy for single valence electron. 6
 (b) What is the significance of Larmor's precession theorem in atomic structure ? 2
5. (a) Discuss the following : 6
 (i) Quantum states of atomic electrons
 (ii) Term value
 (iii) Multiplicity of terms.
 (b) Find the values of S, L and J for terms $1P_1$, $3S_1$, $3P_2$ and $3D_2$. 2

Unit III

6. Explain spin-orbit coupling for an electron and for system of two electrons. Also explain J-J coupling with the help of vector diagram. 8
7. (a) What is Pauli's exclusion principle ? Calculate the possible states for p^2 electronic configuration. 5
 (b) Obtain the spectrum terms of two equivalent electrons. 3

Unit IV

8. (a) What is Zeeman Effect ? Explain splitting of D_1 and D_2 lines of sodium in weak magnetic field. 5
 (b) Distinguish between anomalous Zeeman effect and Paschen-back effect. 3
9. (a) Explain quantization of vibrational and rotational energies of a molecule. 5
 (b) The exciting line in an experiment is 4560 \AA and the stoke line is at 5520 \AA . Calculate the wavelength of anti-stoke line. 3

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Total Pages : 03

GSO/M-18 1774

INORGANIC CHEMISTRY

Paper XVIII

CH-304

Time : Three Hours]

[Maximum Marks : 32

Note : Attempt Five questions in all, selecting at least two questions from each Section. Q. No. 1 is compulsory.

1. (i) Which is stronger base between 2-methylpyridine and 4-picolene ? 1
- (ii) What is conjugate acid of CH_3COOH ? 1
- (iii) Write conjugate base of $[\text{Al}(\text{H}_2\text{O})_6]^{3+}$ ion. 1
- (iv) How many Iron atoms are present in a molecule of haemoglobin ? 1
- (v) What is function of Ferritin ? 1
- (vi) Name the first metal olefin complex. 1
- (vii) What is a Fluxional Ligand ? 1
- (viii) Discuss oxidation states of 'N' and 'P' in phosphazenes. 1

Section A

2. (a) Explain the Dewar-Chat model of Zeise's salt. 3
 (b) Classify the following metal ions into hard and soft acids : 3
 Ti^{3+} , Pt^{4+} , Au^+ , I^+ , Ce^{4+} , La^{3+} , Ca^{2+} and Th^{4+} .
3. (a) What are the factors which increase the stability of metal alkyl compounds ? 3
 (b) Discuss the applications of organotin compounds. 2
 (c) What do you mean by symbiosis ? 1
4. (a) Explain Pearson's HSAB principle and its applications. 3
 (b) Which is stronger acid between $[Fe(H_2O)_6]^{3+}$ and $[Al(H_2O)_6]^{3+}$ ion ? 1
 (c) Discuss bonding in organoaluminium compounds. 2

5. (a) Complete the following reactions : 3
 $FeCl_2 + (C_5H_5)_2MgB_2 \rightarrow$
 $AlN_2Cl + Hg \rightarrow$
 $CH_3HgF + HSO_3^- \rightarrow$
 (b) Explain Lux-Flood concept of acids and bases. 2
 (c) Which of the following obey EAN rule ? 1
 $Fe(\pi-C_5H_5)_2$, $Co_2(CO)_8$ ($RC \equiv CR$).

Section B

6. (a) What are metalloporphyrins and mention their importance ? 4
 (b) What are silicone elastomer ? Give their applications. 2
7. (a) Discuss the functioning of haemoglobin. 3
 (b) What is Bohr's effect ? 2
 (c) Discuss block-copolymers of polysiloxanes. 1
8. (a) What is importance of Na-K Pump ? 2
 (b) Explain bonding in triphosphazene. 4
9. (a) Give the physiology of myoglobin. 2
 (b) Discuss silicone fluids and their applications. 2
 (c) Discuss biological role of Ca^{2+} ion. 2

Roll No.

Total Pages : 03

GSC/M-18 1775

CHEMISTRY

Paper XVIII

CH-304

Inorganic Chemistry

Time : Three Hours]

[Maximum Marks : 27

Note : Attempt *Five* questions in all, selecting at least *two* questions from each Section.

Section A

1. (a) Write down formula of the following : 1½
- (i) Bis (Pentacarbonyl manganese)
- (ii) (η^3 -allyl) tricarbonyl cobalt.
- (iii) Bis (η^5 -cyclopentadienyl) hydridorhenium.
- (b) Discuss the bonding in organolithium compounds 1½
with diagram.
- (c) Define EAN rule. Calculate EAN of iron in
[Fe(CO)₃(C₄H₉)]. 1½
- (d) Give any *two* methods of preparation of metal-
carbonyl. 1

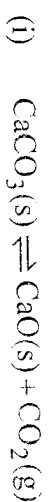
2. (a) Discuss bonding in Metal-Olefin complexes. 2½
 (b) What do you understand by β -elimination in metal alkyls? How can it be avoided? 1½
 (c) Give three applications of organo aluminium compounds. 1½
3. (a) What is Lux Flood concept of Acids and bases? 2
 (b) Define conjugate acid-base pair. Show that strong acid HCl has weak conjugate base. 1½
 (c) Comment on feasibility of the following reactions: 1½
 (i) $\text{CH}_3\text{HgOH} + \text{HSO}_3^{-1} \rightarrow \text{CH}_3\text{HgSO}_3^{-1} + \text{H}_2\text{O}$
 (ii) $\text{CH}_3\text{HgSO}_3^{-1} + \text{OH}^{-1} \rightarrow \text{CH}_3\text{HgOH} + \text{SO}_3^{-2}$
4. (a) Write any two applications of HSAB principle. 2½
 (b) H_2SO_4 is more acidic than H_3PO_4 . Explain. 1½
 (c) Why BF_3 is less acidic than BCl_3 ? Explain. 1½

Section B

5. (a) What are essential and non-essential elements. 1½
 (b) What are Metallo Porphyrins? What are essential conditions that a metal ion is coordinated with porphin ligand? 2½
 (c) Sodium pump is electrogenic in nature. Comment. 1½

6. (a) Discuss briefly role of alkali metal ions in biological system. 2
 (b) What is Nitrogenase? What role does it play in fixation of N_2 ? 2
 (c) Carbon monoxide is known to be powerful π acceptor compared to dioxygen O_2 . Yet it does not instantaneously bind strongly to Haemoglobin. Explain. 1½
7. (a) Explain Homomorphous and Heteromorphous π system in triphosphazene. 2
 (b) What are Silicones? How are cyclic silicones prepared? 2
 (c) What do you understand by Block and Graft Copolymers? 1½
8. (a) Why do Polyphosphazene chain prefer cis-trans conformation to trans-trans conformation? 1½
 (b) Explain different types of silicone elastomers with their uses. 2
 (c) What happens when : 2
 (i) Silicone is heated with LiAlH_4 .
 (ii) Tri Chlorosilane reacts with benzene.

- (b) How many number of Phases and Components are present in the following systems :



- (ii) Rhombic Sulphur in equilibrium with Monoclinic Sulphur. 3

- (c) Calculate the Degrees of Freedom of Pb-Ag system at the eutectic point. 1

8. (a) Differentiate between Ideal and Non-Ideal solutions. 2

- (b) 10 g of a substance dissolved in 100 g of water raised its boiling point by 0.98°C . Calculate the molecular weight of the substance. The molal elevation constant for water is 0.52°C per molality. 2

- (c) State and explain Raoult's law. 2

9. (a) Derive the thermodynamically the relation :

$$\Delta T_f = K_f \times m,$$

where m is molality of the solution. 3

- (b) How can you justify that Osmotic pressure is a colligative property ? 1½

- (c) Explain, why equimolar solutions of KCl and glucose do not have the same boiling point. 1½

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Total Pages : 04

GSO/M-18 1776

PHYSICAL CHEMISTRY

Paper XIX

CH-305

(Theory)

Time : Three Hours]

[Maximum Marks : 32

Note : Attempt *Five* questions in all, selecting at least *two* questions from each Section. Q. No. 1 is compulsory. Use of Log-table and Non-programming calculator is allowed.

(Compulsory Question)

1. (a) What is the significance of Partition Function of a system in Statistical Thermodynamics ? 2
- (b) Define Stark-Einstein's law of photochemical equivalence. 1
- (c) What do you mean by 'Quantum Yield' of photochemical reactions ? 1
- (d) What is 'Eutectic Mixture' ? 1
- (e) How are bivariant, univariant and non-variant systems represented in a phase diagram ? 1
- (f) Define Osmotic Pressure. 1

- (g) What is the difference between Molarity and Molality of a solution ? 1

Section A

2. (a) For the photochemical reaction $A \rightarrow B$, 1.0×10^{-5} moles of B are formed on absorption of 6.0×10^7 ergs at 3600 Å. Calculate the quantum efficiency of the reaction. 3
- (b) Differentiate the following : 3
 - (i) Fluorescence and Phosphorescence
 - (ii) Internal Conversion and Intersystem Crossing.
3. (a) Explain the term 'Photosensitization' by giving three suitable examples. 3
- (b) Calculate the value of an Einstein of energy in electron volts for radiation of frequency $3 \times 10^{13} \text{ S}^{-1}$. 1½
- (c) State and explain Grothius-Draper law. 1½
4. (a) Show that complete partition function for a system is given by the product of translational, rotational, vibrational and electronic partition functions. 3
- (b) Derive an expression for translational partition function of a particle. 3

5. (a) Maximizing the thermodynamic probability of a macrostate and using the method of Langrange's undetermined multipliers, derive the expression for Maxwell-Boltzmann distribution law in the form :

$$n_i = g_i e^{-\alpha - \beta \epsilon_i}$$

where the symbols have their usual meanings. 4

- (b) What is Statistical Mechanics ? Why there was a need for the branch of Statistical Mechanics ? 2

Section B

6. (a) Calculate the total number of variables for a heterogeneous system consisting of C components distributed among P phases. 2
- (b) Ammonium chloride is heated in a closed vessel; the system can be either a one component system or a two component system. Explain. 1½
- (c) With the help of a diagram, explain the application of Phase Rule in the extraction of pure lead from argentiferous lead. 2½
7. (a) Draw a well labelled phase diagram of water system. What do you interpret from the slope of the melting point curve ? 3

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Total Pages : 03

GSO/M-18 1777

PHYSICAL CHEMISTRY

Paper-XIX

CH-305

Time : Three Hours]

[Maximum Marks : 26

Note : Attempt *Five* questions in all, selecting at least *two* questions from each Section.

Section A

1. (a) Briefly explain Franck-Condon principle. 3
- (b) In the electronic band spectrum, which transition out of $n \rightarrow \pi^*$ and $\pi \rightarrow \pi^*$ will give greater intensity and why ? What happens if an acid is present ? 1½
- (c) In the electronic band spectrum, why there are no simple selection rules for transition among vibrational levels ? 1
2. (a) What do you understand by Quantum yield of a photochemical reaction ? What are the causes of high or low quantum yield ? 3

- (b) State and explain law of photochemical equivalence. How are the discrepancies between the Einstein's law and Experimental results explained. 2
3. (a) Calculate the value of wavelength of light if the value of one Einstein is 90 kcal. 2
- (b) Discuss the salient features observed in electronic spectrum of a Diatomic molecule. 3
4. (a) Write explanatory notes on Grothaus-Draper law and Lambert-Bear's law. 3
- (b) What do you understand by Chemiluminescence ? Give two examples. 2

Section B

5. (a) Define 'Osmotic Pressure'. How is it determined by Berkeley and Hartley's method ? 3
- (b) Calculate the freezing point of a solution containing 0.520 g of glucose ($C_6H_{12}O_6$) in 80.2 g of water (K_f for water = 1.86 Km^{-1}). 2
6. (a) Derive from thermodynamic considerations the relation between elevation in boiling point and molecular weight of non-volatile solute. 3

- (b) Explain, why do we observe abnormal molecular masses of solute in certain cases when determined by colligative properties ? 2
7. (a) Draw a well labelled phase diagram of water system and discuss its salient features. 2½
- (b) State and explain what is meant by the term phase, component and degree of freedom. How are they related ? 2½
8. (a) Mention three characteristics of ideal solutions. What causes deviations from ideal behaviour ? Discuss positive deviation and negative deviation from ideal behaviour for liquid pairs. 3½
- (b) Deduce thermodynamically the Phase rule equation. 2

Roll No.

Total Pages : 04

GSQ/M-18 1778

ORGANIC CHEMISTRY

Paper XX

CH-306

Time : Three Hours]

[Maximum Marks : 32

Note : Attempt *Five* questions in all, selecting *two* questions from each Section. Q. No. **1** is compulsory.

1. Attempt any *four* of the following :

- (a) How will you explain the acidic nature of methylenic hydrogen in diethyl malonate.
- (b) Pyrrole is acidic in nature. Explain.
- (c) Describe Gabriel phthalimide synthesis of α -amino acid.
- (d) What are differences between RNA and DNA ?
- (e) Explain Liebig-Natta polymerisation with mechanism. 2×4

Section A

- 2.** (a) Explain the formation of ethylaceto-acetate from ethylacetate and sodium ethoxide with mechanism.

(b) Describe the secondary structure of proteins.

(c) Give evidence to support dipolar structure of α -amino acid. 3+1½+1½

8. (a) What are polyesters and polyamides ? Name the type of polymerisation involved. Give one example of each with preparation and uses.

(b) Give the preparation and uses of : 4+2

(i) Buna-S

(ii) Neoprene.

9. (a) Write a short note on natural and synthetic rubber.

(b) Give the preparation and uses of phenol formaldehyde polymer.

(c) What is denaturation of protein. 3+2+1

- (b) Write down the synthesis of succinic acid and *n*-butyric acid from diethyl malonate.
- (c) Describe the factors affecting the relative amount of Keto and enol form in Keto-enol tautomerism.
- 2×3

3. (a) Give the synthesis of the following from ethylacetoacetate :
- (i) 3-methyl-2-pentanone
- (ii) *n*-valeric acid.

- (b) Explain Chickibabin reaction with mechanism.
- (c) Compare the aromatic character of furan, thiophene and pyrrole.
- 3+1½+1½

4. (a) Explain :
- (i) Electrophilic substitution of pyridine takes place with difficulty, when it does, it takes place at 3-position.
- (ii) Electrophilic substitution in indole takes place at 3-position of heterogegele ring.

- (b) Explain :
- (i) Parr-Knoorr synthesis of furan derivatives.
- (ii) The mechanism of Fischer indole synthesis.
- 2×3

5. (a) Compare the basic character of pyridine, piperidine and pyrrole.
- (b) What happen when ?
- (i) Indole treated in Sn/HCl.
- (ii) Quinoline is treated with Br₂/Ag₂SO₄.
- (iii) Isoquinoline is treated with NaNH₂ in liq. NH₃.
- (iv) Quinolene treated with alk. KMnO₄.
- (c) Why does Pyridine give nucleophilic substitution reaction but not benzene ?
- 2×3

Section B

6. (a) Explain :
- (i) Edman's method of N-terminal residue analysis.
- (ii) Why amino acid are called amphoteric compound ?
- (b) Discuss the stereochemistry of α-amino acid.
- (c) Describe merifield solid phase peptide synthesis.
- 3+1½+1½

7. (a) Explain the following :
- (i) Electrophoresis
- (ii) Zwitter ion
- (iii) Peptide bond.

(c) Write about different types of stereochemical arrangements in polymers. 2,2,1½

8. (a) Starting from malonic ester prepare :

(i) Succinic acid

(ii) Cyclobutane carboxylic acid.

(b) Write briefly about isoelectric point and electrophoresis in amino acid.

(c) Give one example for each (only name to be given) of the following types of polymers :

(i) Polyester

(ii) Poly amide

(iii) Phenol-formaldehyde resin. 2,2,1½

Roll No.

Total Pages : 04

GSO/M-18 1779

ORGANIC CHEMISTRY

Paper III

XX-CH-306

Organic Chemistry (Theory)

Time : Three Hours]

[Maximum Marks : 27

Note : Attempt *Five* questions in all, selecting at least *two* questions from each Section. All questions carry equal marks.

Section A

1. (a) Arrange Pyridine, Pyrrole and Piperidine in increasing order of basic character, with reason.

(b) Write about molecular orbital structure of Pyrrole.

(c) Give a general mechanism of electrophilic substitution in furan. 2,2,1½

2. (a) What happens when :

(i) Quinoline is treated with nitrating mixture
(HNO₃ + H₂SO₄).
conc. conc.

(ii) Isoquinoline is treated with NaNH₂, liq. NH₃.

- (b) Sketch the following reaction and give its mechanism :

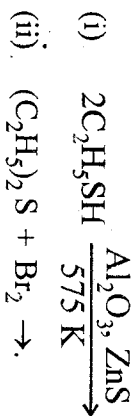


- (c) Write the equations of acetyl acetone reaction with :

- (i) NH_3
(ii) P_2O_5
(iii) P_2S_5

2,2,1½

3. (a) Complete the equations :



- (b) Give the preparation of sulphaguanidine.
(c) Write the IUPAC name of :

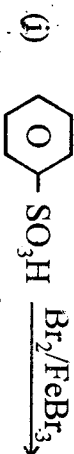
- (i) Diethyl sulphide
(ii) Cyclohexyl mercaptan
(iii) Iso-propyl mercaptan.

2,2,1½

4. (a) Convert :

- (i) Ethanol to Ethanethiol
(ii) Ethyl iodide to Diethylthioether.

- (b) Complete the equations :



- (c) Comment upon relative aromatic character of Pyrrol, Thiophene and Furan.

2,2,1½

Section B

5. (a) How the ethylacetoacetate be prepared ?

- (b) Starting from ethylacetoacetate prepare :

- (i) n-Valeric acid
(ii) Acetyl acetone.

- (c) Of the exolate ion obtained from acetone and diethyl malonate which is more stable and why ? 2,2,1½

6. (a) Convert diethyl malonate to α-amino acid by curtius reaction.

- (b) Write about classical peptide synthesis.
(c) Compare fibrous and globular proteins. 2,2,1½

7. (a) Illustrate different steps of free radical vinyl polymerisation.

- (b) Write the methods of preparation and uses of :

- (i) Teflon
(ii) Styron
(iii) Acrilan
(iv) PVC.

Roll No.

Total Pages : 02

GSC/M-18
1782

BOTANY

Paper I

Biochemistry & Plant Biotechnology

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all. Q. No. **1** is compulsory.
Attempt *two* questions from each Unit. All questions carry equal marks.

(Compulsory Question)

1. (a) Who proposed the Induced Fit Theory.
(b) Define Antiauxins.
(c) Name the hormone associated with cell division.
(d) Give composition of fat.
(e) Define cellular totipotency.
(f) What is a basal medium ?
(g) What are restriction endonuclease enzymes ?
(h) Cryopreservation.

1×8=8

Section A

2. Discuss Michaelis-Menten constant in detail.

8

(2×4/13) L-1782

3. Write notes on the following :

- (a) Enzyme Inhibition
- (b) Physiological effects of Cytokinin.

4+4=8

4. Write notes on the following :

- (a) Ethylene hormone
- (b) Bolting.

4×2=8

5. Explain the synthesis of glycerol and fatty acids in plants.

8

Section B

6. Describe the Biochemistry of Nitrogen fixation in leguminous plants.

8

7. Write notes on the following :

- (a) Symbiotic Nitrogen fixation in legumes
- (b) Nitrification.

6+2=8

8. Discuss the various methods of gene transfer in plants.

8

9. Discuss the following :

- (a) Methods of protoplast isolation
- (b) Plasmids.

4×2=8

U.T.O.

L-1782

2

3.100

GSC/M-18

1783

BOTANY

Paper II

Economic Botany

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt Five questions in all, selecting two questions from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

1. Answer the following :

- (a) What is the morphological nature of spice clove ?
- (b) Which state of India contributes maximum in Jute production ?
- (c) Give botanical name of sunflower.
- (d) Name the centre of origin of potato.
- (e) Define wood seasoning.
- (f) What are Beverages ?
- (g) What are Cereals ?
- (h) What is the name of branch of science that deals with study of drug plants ?

1×8

9/141-L-1783

P.T.O.

Unit I

2. Give a concise account of origin, botanical description, cultivation and uses of Maize. 8
3. Write short notes on the following :
(a) Onion (b) Pea. 4+4
4. Briefly describe origin, distribution, cultivation and uses of groundnut. 8
5. Give botanical names and uses of the following :
(a) Cotton (b) Mustard
(c) Gram (d) Wheat. 2+2+2+2

Unit II

6. What are Beverages ? Describe cultivation and processing of Coffee. 8
7. Name the plant part used and uses of the following :
(a) Atropa (b) Ginger
(c) Herca (d) Sugarcane. 4+4
8. Write short notes on the following :
(a) Cinchona (b) Cannabis. 4+4
9. Write in brief on the following :
(a) Bio-fuels (b) Sources of Timber. 4+4

L-1783

2

3,100

Roll No.

Total Pages : 02

GSQ/M-18

1784

ZOOLOGY

Paper I

Aquaculture and Pest Management-I

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *two* questions from each Section A and B. Q. No. 1 is compulsory. Support your answer with neat and labelled diagrams wherever required.

1. Explain the following in about 20 words each :

- | | |
|---|-----------------------|
| (a) Pest | (b) EEZ |
| (c) Polyculture | (d) Dinghi |
| (e) Gill net | (f) Capture fisheries |
| (g) Monophagous | (h) Honey dew |
| (i) Ratoon crop | |
| (j) Zoological name of Gurdaspur Borer. | |
- 1.5×10=15**

Section A

2. What is a riverine fishery ? Enlist the riverine systems in India. Describe *one* of these in detail. **6.25**

(2-10/1) L-1784

P.T.O.

3. What are fishing crafts ? Describe various types of fishing crafts in detail. **6.25**

4. Write notes on the following :

- | | |
|---------------------------|--------------------|
| (a) World Fish Production | |
| (b) Crustacean Culture. | 3+3.25=6.25 |

5. Write notes on the following :

- | | |
|---------------------------|--------------------|
| (a) Induced breeding | |
| (b) Cold water fisheries. | 3.25+3=6.25 |

Section B

6. Explain the systematic position, habits, nature of damage, life-cycle and control of wheat stem borer. **6.25**

7. Discuss the nature of damage caused and habits of the following pests :

- | | |
|----------------------------|--------------------|
| (a) Rice stem borer | |
| (b) The pumpkin fruit fly. | 3+3.25=6.25 |

8. Give the systematic position of the following pests :

- | | |
|----------------------------|--------------------------|
| (a) The red pumpkin beetle | (b) Cotton jassid |
| (c) Gundhi bug | (d) Sugarcane top borer. |
- 1.5+1.5+1.5+1.75=6.25**

9. Write notes on the damage causing stage and control of the following pests :

- | | |
|-------------------------|----------------------|
| (a) Sugarcane white fly | (b) Pink bolloworm |
| (c) The vegetable mite. | 2+2+2.25=6.25 |

L-1784

2

3,000

Roll No.

Total Pages : 02

GSQ/M-18 1785

ZOOLOGY

Paper II

Aquaculture and Pest Management-II

Time : Three Hours]

[Maximum Marks : 40

Note : Q. No. 1 is compulsory. Answer to each part should not exceed **20** words. Attempt *Four* questions selecting *two* questions from each Section. So total questions to be attempted are *five* including Q. No. 1.

1. (a) Define Hypophysation.
(b) Define everyphagic fishes.
(c) Explain the term RAS.
(d) What is pharmacopoeia ? Give its significance.
(e) Write systematic position of Rice Weevil ?
(f) What is the source of Pyrethrum ?
(g) Name two rodent pests.
(h) What is zoological name of 'Dhora' ? **1×8=8**

Section A

2. (a) Describe the various natural fish seed resources. **5**
(b) Describe natural breeding of fishes **3**

3. (a) What is fish feed ? Explain natural and artificial fish feed. **5**
(b) Write a note on pelleting. **3**
4. (a) What is recycled water culture ? What are its advantages ? **4**
(b) Write a note on polyculture. **4**
5. (a) Explain the management of fishery. **6**
(b) How fishes and their products should be marketed ? **2**

Section B

6. (a) Explain the life-cycle and control of *Stenophyllus* **6**
Oryzae.
(b) What is the damage causing stage of *Tribolium* **2**
Castaneum and how can it be controlled ?
7. What is Biological control of Insect pests ? Write the requirements, problems and precautions of Biological control. Explain the natural enemies used in Biological control of insect pests. **8**
8. (a) Explain the insecticide of botanical origin. **4**
(b) Describe the various types of insecticide on the basis of mode of entry and mode of action. **4**
9. What is the use of entomological collection in insect pest management ? **3**

Roll No.

Total Pages : 03

GSO/M-18 1788

ELECTRONICS

Paper I

**Microprocessor Architecture
and Programming-II**

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. **1** is compulsory.

1. (a) What do you understand from vectored and non-vectored interrupts ? Explain with example. 2
- (b) Write BSR control words to first set and then reset PC₅ of Port C in PPI 8255. 2
- (c) If a clock frequency of 2 MHz is applied to 8253 for square wave generation, what will be the time period of the output waveform if count loaded in the selected counter is 10 ? 2
- (d) Explain, why each channel in the 8257 DMA controller is restricted to 16K bytes of data transfer. 2

Unit I

2. (a) Discuss in brief programmed, interrupt driven and DMA data transfer schemes. 6
- (b) Explain the instruction EI and DI. 2
3. (a) Mention different interrupt lines of 8085 ? Discuss their main features. 6
- (b) Write instructions to enable all interrupts of 8085 microprocessor except RST 7.5. 2

Unit II

4. (a) Explain control word of PPI 8255. 4
- (b) Explain with example how different ports of PPI 8255 are identified in peripheral (or direct) I/O and memory mapped I/O scheme ? What are the different instructions and control signals used for I/O operations ? 4
5. (a) Discuss various Output handshake signals exchanged between microprocessor and PPI 8255 prior to data transfer in Mode 1. Write control word and status word. 6
- (b) Write a control word to configure PPI 8255 in Mode 2, where Port B is used as Output port in Mode 1. 2

Unit III

6. (a) Discuss the control logic (signals) or programmable interval timer of 8253. 4
- (b) Explain Mode 0 i.e. Interrupt on terminal count of 8253. Where this mode is useful ? 4
7. (a) Discuss how 8253 is used to generate software and hardware triggered strobe. Draw timing diagrams. 6
- (b) Determine the frequency of the output waveform from the counter, loaded with count 4 of 8253 operated in Mode 2 and driven by a clock of 1 MHz. 2

Unit IV

8. (a) Discuss the function of each signal of the control logic block of 8257 DMA controller. 6
- (b) What is the function of DRQ and DACK signals of 8257 DMA controller ? 2
9. Design and discuss in detail a microprocessor based temperature measurement and control system. 8

Roll No.

Total Pages : 03

GSO/M-18 1789

ELECTRONICS

Paper II

Introduction to C and its Programming

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. 1 is compulsory.

1. (a) What are Identifiers ? Explain. 1½
- (b) What is the purpose of comma operator ? 1½
- (c) List various advantages of an array. 2½
- (d) Explain how single precision constant is written and identified. 2½

Unit I

2. (a) What are keywords in C ? What restrictions apply to their use ? 2
- (b) What is an escape sequence ? Give its use. 3
- (c) What are unary operators ? How many operands are associated with a unary operator ? Explain. 3
3. (a) What is an expression ? What kind of information is represented by an expression ? 3

- (b) Name and explain four basic types of constants in C. 2
- (c) What is conditional operator ? Explain the use of the conditional operator to form conditional expression. 3

Unit II

4. (a) Explain Printf function with suitable example. How is it different from Puchar function. 3
- (b) What is the importance of using precedence rule in the C operators ? 2
- (c) Explain the meaning and use of cast operator with the help of suitable example. 3
5. (a) Explain the following :
 (i) Break statement (ii) Continue statement
 (ii) Go to statement. 3
- (b) Write a program to find the sum and average of given seven numbers using do while loop. 5

Unit III

6. (a) Explain main components of function definition. 1½
- (b) Explain uses of functions. 2½
- (c) Write a program to find the sum of five numbers using function. 4

7. (a) What do you mean by formal and actual arguments ? What is the relation between them ? 4
- (b) What is the purpose of return statement ? 2
- (c) Explain the meaning of following : 2
- (i) float f(float a, float b) (ii) long f(long a)
 (iii) void f(int a) (iv) char f(void).

Unit IV

8. (a) Define multidimensional array. How is it initialized ? 3
- (b) What is Pointer ? What kind of information is represented by pointer variable ? 3
- (c) Describe the array that is defined in the following statement : 2

```
(i) # define N 50      (ii) # define A 66
.....               # define B 132
int a [N];             .....
char memo [A][B]
```

9. (a) What is the character array ? How is it different from data type array ? 3
- (b) How strings are initialized in C ? What are commonly used strings in C ? 3
- (c) Write an appropriate declaration for each of the following :
 (i) Declare a one-dimensional floating point array using pointer notation
 (ii) Declare two pointers whose objects are integer variable *i* and *j*. 2

Roll No.

Total Pages : 03

GSO/M-18 1790

COMPUTER SCIENCE

Paper I

Relational Data Base Management System

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. 1 is compulsory.

(Compulsory Question)

1. (a) Explain division operator of Relational Algebra. 2
(b) Define functional and fully functional dependency. 2
(c) Explain the differences between SQL and programming languages. 2
(d) Explain advantages of PL/SQL. 2

Unit I

2. (a) Explain by using example the **concept** of Network data Model. Also explain its advantages and disadvantages. 4
(b) Explain the differences between Hierarchical and network data model. 4

3. (a) Explain with example set oriented operators. 4
- (b) Discuss the various types of Join operations with example. 4

Unit II

4. (a) Explain, what is the basic differences between tuple-oriented and domain oriented relational calculus. 3
- (b) What is Normalization ? Why its need arises ? Explain with example 2 NF. 5
5. Define and explain Boyce-Codd Normal form. How does it differs from 2NF ? Why is it considered a stronger form of 3NF ? 8

Unit III

6. Explain with example the following commands in SQL :
 - (i) ALTER TABLE (ii) SELECT Command
 - (ii) GRANT Command (iv) COMMIT Command 8
7. (a) What is a view in SQL and how is it defined ? Also explain the advantages of view. 4
- (b) What do you mean by constraints ? Explain primary key constraints, check constraint and foreign key constraints. 4

Unit IV

8. (a) Explain the structure of PL/SQL block. 3
- (b) Write the syntax of if-then-elseif statement. Also explain the use of if-then-elseif statement with the help of a program of your choice. 5
9. (a) Explain while-loop and for-loop statements. 3
- (b) Write a program to compute average of n number. 5

Roll No.

Total Pages : 02

GSO/M-18

1792

COMPUTER SCIENCE
Paper II
Computer Networks

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit in addition to compulsory Q. No. 1. All questions carry equal marks.

(Compulsory Question)

1. (a) What is Bridge ? Explain its working.
- (b) Differentiate between Analogy and Digital Data Communication.

- (c) Write short note on Gigabit Ethernet.
- (d) Explain the concept of Load Shedding. **4×2=8**

Unit I

2. Explain the difference between OSI and TCP/IP Reference Model. **8**

(3-09/10)L-1792

P.T.O.

3. Explain some Key design Issues that occur in Computer Networks. **8**

Unit II

4. What do you mean by Switching ? Explain the various switching techniques. **8**
5. What is Multiplexing ? Explain various types of multiplexing. **8**

Unit III

6. What do you mean by Bluetooth ? Explain its Architecture. **8**

7. (a) Write short note on Token Ring ? **8**
- (b) Explain CSMA and CSMA/CD.

Unit IV

8. Explain Traffic Shapping Congestion Control Algorithm. **8**
9. Write short notes on the following : **8**
 - (a) WWW Services
 - (b) DNS.

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2

3,400

Roll No.

Total Pages : 03

GSO/M-18 1794

COMPUTER APPLICATIONS

Paper I

Multimedia Tools

Time : Three Hours]

[Maximum Marks : 40

Note : Q. No. 1 is compulsory. Candidates are required to attempt *Five* questions in all, selecting *one* question from each Unit, in addition to compulsory Q. No. 1. All questions carry equal marks.

1. (a) What is Edutainment ? 2
- (b) Compare briefly JPEG and GIF file formats. 2
- (c) Define Pixel. 1
- (d) Write any *two* advantages of Digital video over analog video. 1
- (e) What is Rotoscoping ? 1
- (f) What is video Streaming ? 1

Unit I

2. What is Multimedia ? Discuss its applications in entertainment and performing arts. 8

3. Write short notes on the following : 8

- (a) Multimedia communication devices
- (b) Multimedia projects.

Unit II

- 4. (a) What are Postscript, True Type and bitmapped fonts ? Explain. 4
- (b) Differentiate between bitmap and vector graphics. 4

- 5. (a) What is the importance of graphics in multimedia ? Explain briefly. 4
- (b) Explain various image capturing methods with suitable example. 4

Unit III

- 6. What are the attributes of Sound ? Discuss the differences between analog and digital sound. 8

- 7. Write short notes on the following : 8
 - (a) Cell animation
 - (b) Morphing.

Unit IV

- 8. What is digital video compression ? Explain briefly various digital video compression techniques. 8

- 9. Write short notes on the following : 8

- (a) SECAM video standard
- (b) Graphics support in HTML.

Roll No.

Total Pages : 02

GSQ/M-18

1796

COMPUTER APPLICATION

Paper II

Advanced Program Using C++

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory.

1. (a) Define Pure Virtual Function.
- (b) Differentiate Protected and Public Derivations.
- (c) Differentiate Text v/s Binary files.
- (d) What is a Template ? 2×4=8

Unit I

2. What is Dynamic Polymorphism ? Explain with an example of function overriding. 8
3. Explain virtual derivation and virtual destructor with example. 8

Unit II

4. Explain type conversion between objects of different classes. 8
- (3-10/3) L-1796 P.T.O.

5. Write a program showing three types of Derivations. 8

Unit III

6. Explain types of Inheritance and write a program to show multipath inheritance. 8

7. Explain Templates. Write a program to show function Templates. 8

Unit IV

8. Explain Opening Files. Write a program to store student data in a file—"stud" and then Retrieve the stored data. 8

9. Explain Exception Handling. Write a program to show try, throw and catch. 8

Roll No.

Total Pages : 02

GSO/M-18

1799

BIOTECHNOLOGY

Paper XIII

Microbial Biotechnology

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) What is importance of enrichment media in isolation of bacteria ?
(b) Give advantages of continuous fermentation over batch fermentation.
(c) Define solid state fermentation and give its significance for fermentation industry.
(d) Name two fungi known to be employed as bioinsecticides.
(e) Name two organisms used for SCP production for human consumption.

2,2,2,1,1

Unit I

2. Write short notes on the following :
(a) Lyophilization
(b) Measurement of dissolved oxygen in a fermenter
(c) Synchronous growth.
3. What are the different methods for preservation of industrially important microorganism and which method you think is best for culture collection service and why ?
4. Write short notes on the following :
(a) Airlift reactor
(b) Bubble column reactor
(c) Methods for cells disintegration.

3,3,2

8

Unit II

5. Describe the microbial fermentation for grape wine production.
6. Write short notes on the following :
(a) Citric acid fermentation
(b) Single Cell Proteins.
7. Write short notes on any *two* of the following :
(a) Polyhydroxyalkanoates
(b) Biomining
(c) Secondary waste water treatment.

4,4

4,4

Roll No.

Total Pages : 03

GSO/M-18 1840

DIETETICS-II

Course 311

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

प्रत्येक इकाई में से दो प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Compulsory Question (अनिवार्य प्रश्न)

1. Discuss the following :

3+3+2

- (a) Differentiate NIDDM and IDDM.
 - (b) Differentiate Acid ash and Alkali ash diets.
 - (c) Causes for Nephritis.
- निम्नालिखित को समझाइए :

- (अ) NIDDM तथा IDDM में अन्तर कीजिए ।
- (ब) एसिड राख तथा ऐल्कली राख आहार में अन्तर कीजिए ।
- (स) नेफ्राइटिस के कारण ।

Unit I (इकाई I)

2. Describe in detail the dietary and nutritional management for a patient suffering from NIDDM. 8
NIDDM से ग्रसित एक रोगी के लिए आहार तथा पोषण सम्बन्धी प्रबन्ध का विस्तृत वर्णन कीजिए ।
3. (a) What is Hypertension ? Describe in detail its various causes and symptoms.
उच्च रक्त चाप क्या है ? इसके विभिन्न कारण तथा लक्षणों का विस्तार से वर्णन कीजिए ।
(b) Suggest different ways to prevent hypertension. 5+3
उच्च रक्त चाप को नियंत्रित करने के उपाय बताइए ।
4. Explain the nutritional management for coronary heart disease in detail. 8
कोरोनरी हृदय रोग वाले व्यक्ति के लिए पोषण प्रबंधन का वर्णन कीजिए ।
5. Comment on the following : 4+4
(a) Causes and symptoms of coronary heart diseases.
(b) Nutritional management for hypertensive patients.
निम्नलिखित पर टिप्पणी कीजिए :
(अ) कोरोनरी हृदय रोग का कारण तथा लक्षण
(ब) उच्च रक्त चाप वाले रोगी के लिए पोषणीय प्रबन्ध ।

Unit II (इकाई II)

6. (a) What is Acute Renal Failure ? Write its causes.
एक्यूट रेनल फेल्योर क्या है ? इसके कारण लिखिए ।
(b) Describe the dietary modifications for Acute Renal Failure. 4,4
एक्यूट रेनल फेल्योर के लिए आहार परिवर्तन का वर्णन कीजिए ।
7. Define Nephritis. Explain the dietary modifications and dietary management during Nephritis. 8
नेफ्राइटिस क्या है ? नेफ्राइटिस के दौरान आहार परिवर्तन तथा आहार प्रबन्धन का वर्णन कीजिए ।
8. What are Kidney Stones ? How are they formed ? Write in detail the role of food in the prevention and treatment of kidney stones. 8
किडनी स्टोन्स क्या हैं ? ये कैसे बनते हैं ? किडनी स्टोन्स की रोकथाम तथा उपचार में भोजन की भूमिका का विस्तृत वर्णन कीजिए ।
9. Define Cancer. Write in detail the dietary management for Cancer. 8
कैंसर की परिभाषा दीजिए । कैंसर के रोगियों का आहार प्रबन्धन लिखिए ।

Roll No.

Total Pages : 03

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DIETETICS-II

Course 311

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. **Q. No. 1** is compulsory. All questions carry equal marks.

प्रत्येक इकाई में से दो प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Compulsory Question (अनिवार्य प्रश्न)

1. Discuss the following :

3+3+2

- (a) Differentiate NIDDM and IDDM.
- (b) Differentiate Acid ash and Alkali ash diets.
- (c) Causes for Nephritis.

निम्नलिखित को समझाइए :

- (अ) NIDDM तथा IDDM में अन्तर कीजिए ।
- (ब) एसिड राख तथा ऐल्कली राख आहार में अन्तर कीजिए ।
- (स) नेफ्राइटिस के कारण ।

Unit I (इकाई I)

2. Describe in detail the dietary and nutritional management for a patient suffering from NIDDM. 8
NIDDM से ग्रसित एक रोगी के लिए आहार तथा पोषण सम्बन्धी प्रबन्ध का विस्तृत वर्णन कीजिए ।
3. (a) What is Hypertension ? Describe in detail its various causes and symptoms.
उच्च रक्त चाप क्या है ? इसके विभिन्न कारण तथा लक्षणों का विस्तार से वर्णन कीजिए ।
(b) Suggest different ways to prevent hypertension. 5+3
उच्च रक्त चाप को नियंत्रित करने के उपाय बताइए ।
4. Explain the nutritional management for coronary heart disease in detail. 8
कोरोनरी हृदय रोग वाले व्यक्ति के लिए पोषण प्रबंधन का वर्णन कीजिए ।
5. Comment on the following : 4+4
(a) Causes and symptoms of coronary heart diseases.
(b) Nutritional management for hypertensive patients.
निम्नलिखित पर टिप्पणी कीजिए :
(अ) कोरोनरी हृदय रोग का कारण तथा लक्षण
(ब) उच्च रक्त चाप वाले रोगी के लिए पोषणीय प्रबन्ध ।

Unit II (इकाई II)

6. (a) What is Acute Renal Failure ? Write its causes.
एक्यूट रेनल फेल्योर क्या है ? इसके कारण लिखिए ।
(b) Describe the dietary modifications for Acute Renal Failure. 4,4
एक्यूट रेनल फेल्योर के लिए आहार परिवर्तन का वर्णन कीजिए ।
7. Define Nephritis. Explain the dietary modifications and dietary management during Nephritis. 8
नेफ्राइटिस क्या है ? नेफ्राइटिस के दौरान आहार परिवर्तन तथा आहार प्रबन्धन का वर्णन कीजिए ।
8. What are Kidney Stones ? How are they formed ? Write in detail the role of food in the prevention and treatment of kidney stones. 8
किडनी स्टोन्स क्या हैं ? ये कैसे बनते हैं ? किडनी स्टोन्स की रोकथाम तथा उपचार में भोजन की भूमिका का विस्तृत वर्णन कीजिए ।
9. Define Cancer. Write in detail the dietary management for Cancer. 8
कैंसर की परिभाषा दीजिए । कैंसर के रोगियों का आहार प्रबन्धन लिखिए ।

Roll No.

Total Pages : 03

GSO/M-18 1841

**TRADITIONAL TEXTILES EMBROIDERIES
AND CONSUMERISM**

Course 312

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

प्रत्येक इकाई में से दो प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Compulsory Question (अनिवार्य प्रश्न)

I. Write short notes on the following : 4×2=8

(a) Jamdani Sari (b) Chamba Rumal

(c) Greese Absorbants (d) Draperies.

निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :

(अ) जामदानी साड़ी (ब) चम्बा रुमाल

(स) चिकनाई अवशोषक पदार्थ (द) ड्रेपरीज ।

Unit I (इकाई I)

2. Explain the details of Chikankari Embroidery. 8
चिकनकारी कढ़ाई की व्याख्या कीजिए ।
3. Write in detail about the history, material, stitches and motifs used in Kantha of Bengal. 8
बंगाल के कांथा कार्य में प्रयुक्त होने वाले कपड़े टांकों और डिजाइन तथा इतिहास के बारे में विस्तारपूर्वक लिखिए ।
4. Write short notes on the following: 2×4=8
(a) Manipuri Embroidery (b) Kasuti Work
निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :
(अ) मणिपुरी कढ़ाई (ब) कसूती कार्य ।
5. Explain the Bhandini Work of Rajasthan. 8
राजस्थान के बांधनी कार्य का वर्णन कीजिए ।

Unit II (इकाई II)

6. Explain, how do special finishes enhance the value of Fabrics ? What influence the consumption of Textiles. 8
Explain.
विशिष्ट परिसज्जा, कैसे वस्त्रों की कीमत को बढ़ाती है ? कपड़ों की खपत को क्या प्रभावित करता है ? व्याख्या कीजिए ।
7. Define Dry Cleaning. Explain the different methods of dry cleaning of Fabrics. 8
ड्राई क्लीनिंग (शुष्क धुलाई) को परिभाषित कीजिए । शुष्क धुलाई की विधियों का वर्णन कीजिए ।

8. While purchasing bed linens what steps will you take into consideration ? 8
बैड लिनन खरीदते समय आप क्या-क्या बातों ध्यान में रखेंगे ? वर्णन कीजिए ।

9. Write briefly the following : 2×4=8
(a) Blankets (b) Towels.
निम्नलिखित पर संक्षेप में लिखिए :
(अ) कंबल (ब) तौलिये ।

Roll No.

Total Pages : 03

GSO/M-18 1842

**ADULTHOOD, GUIDANCE &
COUNSELLING**

Course 313

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all. Select *two* questions from each Unit. Q. No. 9 is compulsory. All questions carry equal marks.

कुल पाँच प्रश्नों के उत्तर दीजिए । प्रत्येक इकाई में से दो-दो प्रश्न चुनिए । प्रश्न संख्या 9 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Unit I (इकाई I)

1. Discuss the social and vocational development during young adulthood. 8

युवावस्था में सामाजिक और व्यावसायिक समायोजन की चर्चा कीजिए ।

2. What do you understand by midlife crisis ? How adults in middle age adjust to changes ? 8
मध्यजीवन के संकट से आप क्या समझते हैं ? मध्य प्रौढ़ावस्था में वयस्क बदलावों के साथ किस प्रकार समायोजन करते हैं ?

3. Discuss the problems during menopause among women. Give suggestions for coping and managing menopausal symptoms. 8
स्त्रियों में रजोवृत्ति में होने वाली समस्याओं की चर्चा कीजिए । रजोवृत्ति के लक्षणों का सामना करने और उन्हें नियंत्रित करने के लिए सुझाव दीजिए ।
4. Describe the physical changes in old age. 8
वृद्धावस्था में शारीरिक बदलावों की व्याख्या कीजिए ।

Unit II (इकाई II)

5. What do you understand by guidance and counselling ? Discuss the need and principles of guidance. 8
निर्देशन एवं परामर्श से आप क्या समझते हैं ? निर्देशन की आवश्यकता तथा सिद्धान्तों का वर्णन कीजिए ।
6. Discuss the counselling techniques used with children. 8
बच्चों के लिए प्रयुक्त होने वाली परामर्श तकनीकों की चर्चा कीजिए ।
7. Write short notes on the following : 8
(i) Strategies of group guidance
(ii) Objectives of group guidance.
निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :
(i) समूह निर्देशन की योजना
(ii) समूह निर्देशन के सिद्धान्त (उद्देश्य) ।

8. What are the qualifications of a good counsellor ? 8
अच्छे परामर्शदाता की क्या योग्यताएँ हैं ?

Compulsory Question (अनिवार्य प्रश्न)

9. Explain any four briefly : 4×2
(i) Marital Adjustment
(ii) Widowhood
(iii) Retirement
(iv) Grandparenthood
(v) Problems of old age
(vi) Characteristics of a counsellor
किन्हीं चार का संक्षिप्त वर्णन कीजिए :
(i) वैवाहिक समायोजन
(ii) वैधव्य
(iii) सेवानिवृत्ति
(iv) दादा-दादी, नाना-नानी की अवस्था
(v) वृद्धावस्था की समस्याएँ
(vi) परामर्शदाता की विशेषताएँ ।

Roll No.

Total Pages : 03

GSO/M-18

1843

INTERIOR DECORATION

Course 314

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *two* questions from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

प्रत्येक इकाई से दो प्रश्न चुनते हुए, कुल पाँच प्रश्नों के उत्तर दीजिए । प्रश्न संख्या 1 अनिवार्य है । सभी प्रश्नों के अंक समान हैं ।

Compulsory Question (अनिवार्य प्रश्न)

1. Answer the following in 3-4 lines each : 1×8=8

- (i) Warm Colours
- (ii) What do you mean by functional accessories ?
- (iii) Mass arrangement of flowers
- (iv) Accessories used in table setting
- (v) Folding furniture
- (vi) Lighting for Masters' bedroom
- (vii) Disadvantages of marble flooring
- (viii) Points to look for in a chair while purchasing it.

निम्नलिखित में से प्रत्येक का 3-4 वाक्यों में उत्तर दीजिए :

- (i) उष्ण रंग
- (ii) कार्यात्मक उपसाधन से आप क्या समझते हैं ?
- (iii) समूह पुष्प व्यवस्था
- (iv) मेज व्यवस्था करते हुए प्रयोग किए जाने वाले उपसाधन
- (v) मोड़े जाने वाला फर्नीचर
- (vi) मुख्य शयन कक्ष में प्रकाश की व्यवस्था
- (vii) पत्थर वाले फर्श की हानियाँ
- (viii) कुर्सी खरीदते हुए किन-किन बिन्दुओं पर विचार करेंगे ?

Unit I (इकाई I)

2. What are the objectives of interior decoration ? Explain any *one* element of art. 8
आन्तरिक सज्जा के क्या उद्देश्य हैं ? किसी एक कला के सिद्धान्त का वर्णन कीजिए ।

3. Describe different types of colour schemes with suitable examples. 8
विभिन्न प्रकार की रंग योजनाओं का उदाहरण सहित वर्णन कीजिए ।

4. Write in detail about equipment and accessories needed for flower arrangement. What points should be followed while doing arrangement ? 8
पुष्प सज्जा के लिए प्रयोग किए जाने वाले उपकरण एवं प्रसाधनों का वर्णन कीजिए । पुष्प व्यवस्था करते हुए हमें किन-किन बातों को ध्यान में रखना चाहिए ?

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2

5. Describe formal table setting in detail for breakfast, major meals and evening tea time. Support your answer with the help of line diagrams. 8
औपचारिक मेज व्यवस्था का वर्णन नाश्ते, सायंकालीन चाय एवं मुख्य भोजन के समय के लिए कीजिए । रेखाचित्रों के द्वारा भी रेखांकित कीजिए ।

Unit II (इकाई II)

6. Write about requirement of light in different areas of a house for performing different activities. 8
विभिन्न गतिविधियों के लिए घर के भिन्न-भिन्न स्थानों पर प्रकाश की आवश्यकता का वर्णन कीजिए ।

7. Which points will you keep in mind while selecting furniture for your home ? 8
अपने घर के लिए फर्नीचर का चुनाव करते समय आप किन-किन बातों पर विचार करेंगे ?

8. Write short notes on the following: 2×4=8
(a) Wall accessories (b) Floor coverings.
निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :
(अ) दीवार के उपसाधन (ब) फर्श बिछावन ।

9. Write in detail about various types and materials used for furniture meant for rest and sleep. 8
आराम एवं निद्रा के लिए प्रयोग किए जाने वाले विभिन्न प्रकार के फर्नीचर व उन्हें बनाने के लिए प्रयोग की जाने वाली सामग्री का वर्णन कीजिए ।

(2-16/6) L-1843

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250

Roll No.

Total Pages : 03

BCA/M-18 1928

WEB DESIGNING USING ADVANCED

TOOLS

BCA-361

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

1. (a) What is the use of delete operators in JavaScript ?
(b) Discuss the syntax and semantic of "in" operator in JavaScript using suitable example.
(c) What is XML Attribute ? What is the use of it ?
Discuss using suitable example.
(d) Write the CSS code to style an element when a user mouses over it.
(e) What is the difference between == and === operators in PHP ?

Unit I

2. (a) Explain the use concatenation operators (i.e. + and &) in VBScript using suitable examples.

- (b) What are the common HTML events ? How can JavaScript react to these events ? Discuss.
3. (a) What are the difference between functions and sub-procedures in VBScript ? Explain using suitable examples.
- (b) How do you add a method to an object in JavaScript ? Explain using an example.

Unit II

4. (a) What are the rules for naming PHP variables ? Discuss.
- (b) What are the different techniques connecting to databases in VBScript ? Explain.
5. (a) What are the different loops available in ASP ? Explain.
- (b) Write a brief note on macro-media Dream-weaver.

Unit III

6. (a) What is the difference between id selector and class selector in CSS ? Explain using suitable examples.
- (b) How can you change the style dynamically using DOM ? Discuss.

7. (a) What is the difference between External, Internal and Inline style sheets ? Explain using suitable examples.
- (b) What are the different techniques to specify the color values ? Discuss.

Unit IV

8. (a) What is a well formed XML Document ? Write a note on the syntax of XML.
- (b) How are the attributes of the element specified using DTD ? Explain using suitable examples.
9. (a) Create an XML document specifying the contact address of person. Make the necessary assumption.
- (b) For the above XML document, create the DTD document.

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Total Pages : 03

BCA/M-18 1930

COMPUTER GRAPHICS

BCA-363

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all. Q. No. 1 is compulsory.

Attempt *four* more questions selecting *one* question from each Unit. All questions carry equal marks.

1. Answer the following in brief :

- (a) What is a bit plane ?
- (b) How is a point represented in a Cartesian Coordinate System ?
- (c) What do you mean by the term scan conversion ?
- (d) How is a point on a circle represented using polar coordinates ?
- (e) What happens when shearing transformation is applied to an object ?
- (f) What is the effect of dragging technique applied to an object ?
- (g) What will be the four bit code for the view area region (viewport/visible area) when Cohen-Sutherland algorithm is applied for clipping lines ?

- (h) What will be the 3-D transformation matrix for scaling if $S_x = S_y = S_z = 2$.

Unit I

2. (a) Explain any *four* applications of computer graphics.
(b) What is the purpose of a look-up table and display processor in a graphics system ?
3. Give brief description of the following :
(a) Plasma panel (b) Joy Stick.

Unit II

4. Explain the Bresenham's algorithm for drawing lines and use it to compute the points on a line with end points as (4, 6) and (11, 8).
5. Distinguish between flood-fill algorithm and scan-line fill algorithm for filling objects.

Unit III

6. Consider a square with diagonal vertices at (2, 2) and (6, 6). What will be the new coordinates of the vertices of the square if it is scaled to 2 times its original size ?
Use matrix computations to derive your answer.

7. (a) Derive the rotation transformation w.r.t. the origin.
(b) What do you mean by composite transformation, inverse transformation, and affine transformation ?

Unit IV

8. Distinguish between a window and a viewport. Describe the 2-D viewing transformation that maps a window in world coordinates onto a normalized viewport using an appropriate example.
9. (a) Describe any *two* three-dimensional display methods.
(b) Write the 3-D transformation matrices for translation and rotation.

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Total Pages : 03

BCA/M-18 1931

INTERNET TECHNOLOGIES

BCA-364

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

((Compulsory Question))

1. (a) What is Remote Procedure Call ?
(b) Explain term IPV4.
(c) Explain the concept of POP protocol.
(d) Explain IPSec.
(e) What is the equivalent layer or layers of the TCP/IP Application layer in terms of OSI reference model ?
(f) What is e-Mail ?
(g) What is static and dynamic routing ?
(h) Briefly describe NAT.

8×2=16

Unit I

2. What is OSI Model ? Explain the functions and protocols and services of each layer. **16**
3. (a) Explain in detail about Internet architecture with neat diagram.
(b) Differentiate between :
(i) USENET and NNTP
(ii) Internet and Intranet. **8+4+4=16**

Unit II

4. (a) Explain the extension headers in IPv6.
(b) Discuss in detail about the role of DNS. **8+8=16**
5. (a) Compare IPv4 and IPv6.
(b) Compare and contrast between DHCP and ARP in detail with their applications. **8+8=16**

Unit III

6. (a) What elements would you use to demonstrate the MIME type ? Explain in detail.
(b) Differentiate between FTP and TFTP. **10+6=16**
7. (a) Elaborate in detail about SMTP and SNMP protocols with an illustration.
(b) Differentiate between RTP and RTCP. **10+6=16**

Unit IV

8. (a) What are the principles of firewall design ? Also explain the various firewall techniques.
(b) What do you mean by internet multicasting ? Discuss. **10+6=16**
9. (a) Discuss in detail about the reliable flooding technique based on link state (OSPF) protocol.
(b) Write a detailed note on Virtual Private Network (VPN). **10+6=16**

Roll No.

Total Pages : 03

BCA/M-18 1932

**ADVANCED PROGRAMMING WITH
VISUAL BASIC
BCA-365**

Time : Three Hours]

[Maximum Marks : 80

Note : Q. No. 1 is compulsory. In addition to that attempt *four* more questions, selecting *one* question from each Unit.
All questions carry equal marks.

((Compulsory Question))

1. (a) Explain any *two* properties of a form.
- (b) What do you mean by a form-load event ?
- (c) How can you add access character to a menu item ?
- (d) What is the difference between toolbar and coolbar ?
- (e) Write the syntax to create a circle in VB.
- (f) What do you mean by LOF and EOF ?
- (g) Enlist the various data bound controls.
- (h) Which data control can be used for remote access ?

8×2=16

Unit I

2. Write a program in VB which creates a collection and show various types of processing such as adding an item, removing an item, counting the items and displaying the items in a collection. 16
3. (a) Write and explain the purpose of the following in VB : 16
 - (i) Load and unload statement
 - (ii) Activate and deactivate events. 8
- (b) Explain drag and drop operation in a form with the help of a small VB program. 8

Unit II

4. Explain the following in detail :
 - (i) Common Dialogue Box
 - (ii) Rich Text Box Control. 16
5. Write a program in VB having menu items File and Edit. Insert New, Open, Save under File menu, and Cut, Copy, Paste under Edit menu. Write the coding for the submenus under edit menu, show the design, and explain the procedure to create this project. 16

Unit III

6. How many types of files can be created in VB ? Explain the use of each type of file using suitable examples. 16
7. Write a VB program for drawing a rectangle filled with blue colour on the form. The starting point of the rectangle is at place where mouse first get down and move to the end point when mouse get released. 16

Unit IV

8. Explain various methods of connecting database with VB. Which of the methods is most suitable to different type of databases ? Explain its major properties and methods in detail. 16
9. Write a program in VB to read and write the employee records from a database. How can you update the database using VB program ? Explain using data access objects. 16

Roll No.

Total Pages : 03

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PROGRAMMING IN CORE JAVA

BCA-366

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt *Five* questions in all. Q. No. 1 is compulsory.

Attempt *four* more questions, selecting *one* question from each Unit.

1. Answer the following questions in brief : 8×2=16

- (i) Explain the signature of main method in JAVA.
- (ii) What is nested class ? What is its usage ?
- (iii) Explain the use of static keyword with an example.
- (iv) What are Command Line Arguments ? Explain.
- (v) Differentiate between interface and abstract class.
- (vi) What is the purpose of the finally clause of a try-catch-finally statement ?
- (vii) What do you mean by polymorphism ? How is it achieved in JAVA ?
- (viii) What are Container classes ? Explain.

Unit I

2. (a) What is byte code ? How is it related to JVM ?
How JAVA is platform independent ? Explain. 8
- (b) Explain the concept of identifiers, literals and keywords in JAVA with examples. 8
3. Explain the following :
 - (a) Hierarchy of Arithmetic and Logical Operators 8
 - (b) For and for.....each statements. 8

Unit II

4. (a) Explain different ways of passing parameters to a method in JAVA programming. 8
- (b) What do you mean by Constructor ? Differentiate between default constructor and parameterized constructor with an example. 8
5. (a) With the use of 2D array write a Java program to interchange the rows and columns of a given matrix. 8
- (b) What is a StringBuffer class and how does it differ from String class ? Explain any *three* methods of class string and string buffer. 8

Unit III

6. (a) How do you define and implement interface in JAVA ? How can you extend an interface ? Explain with an example. 8
- (b) What is Inheritance ? Explain the multilevel inheritance with a suitable example. 8
7. (a) What is a package ? What are the benefits of using packages ? Write down the steps in creating a package. 8
- (b) Explain different access protection which can be used in packages. 8

Unit IV

8. What are Exceptions ? Distinguish between checked and unchecked exceptions in JAVA. How can you create your own exception in JAVA ? Explain with an example. 8,8
9. (a) What is an applet ? Explain the methods used in applet with examples. 8
- (b) Draw and explain the inheritance hierarchy for the component class in AWT. 8

Roll No.

Total Pages : 03

BSIT/M-18 12391

COMPUTER SYSTEM ARCHITECTURE-II

BSIT-601

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all. Q. No. 1 is compulsory.

Attempt *one* question from each Unit.

1. Attempt all questions :

4×2=8

- (a) Give formula for Speedup of a pipeline processing.
- (b) Why we need two-three levels in memory hierarchy ?
- (c) How many operating systems are needed to control a multiprocessor ? Write another name for tightly coupled microprocessors ?
- (d) What is the minimum number of bits that a frame must have in the bit oriented protocol ?

Unit I

- 2. (a) Explain the four-segment instruction pipeline with example. **5**
- (b) Write a short note on memory interleaving. **3**

3. Write short notes on the following : 4×2=8
- (a) Parallel Processing (b) Superscalar Processors.

Unit II

4. (a) What do you mean by Cache memory ? Explain its three types of mappings with examples. 6
- (b) The logical address space in a computer system consists of 128 segments, each segment can have up to 32 pages of 4K words in each. Physical memory consists of 4K blocks of 4K words in each. Formulate the logical and physical address formats ? 2

5. Write short notes on any two of the following :
- (a) Content Addressable Memory
- (b) Auxiliary Memory
- (c) Memory Management Hardware. 8

Unit III

6. Discuss in detail : 8
- (a) Crossbar Switch
- (b) Multistage Switching Network.
7. (a) What do you mean by multiprocessors ? Discuss how multiprocessing improves performance. 3

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2

- (b) Explain 8×8 Omega switching network. 3
- (c) Draw the diagram showing the structure of a three-dimensional hypercube network. List all the paths available from node 011 to 101. 2

Unit IV

8. What is DMA ? Explain the DMA controller and its transfer. 8
9. (a) Draw timing diagram for handshaking transfer ? 5
- (b) How many characters per second can be transmitted over a 1200-baud line in each of the following modes ? (Assume a character code of eight bits)
- (i) Synchronous serial transmission
- (ii) Asynchronous serial transmission with two stop bits
- (iii) Asynchronous serial transmission with one stop bit 3

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Roll No.

Total Pages : 03

BSIT/M-18 12393

IT

BSIT-603

Web Site Implementing Basic Design Tools-II

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (i) Differentiate between check boxes and radio buttons.
- (ii) What are the uses of XML ?
- (iii) How JPEG is different from MPEG ?
- (iv) What do you understand by "HYPERTEXT" ?

Unit I

2. Describe frames and frames based queries. Also write ACTION, METHOD, ENCTYPE, SCRIPT attributes of frame.

3. Write an HTML code for designing the following form :

OPINION POLL

- (i) Name of your organization.
- (ii) Select your continent

America
Africa
Australia
Asia
Europe

(iii) Name of your country

(iv) Main scope :

- (a) S/W Development
- (b) H/W Design
- (c) S/W Sales
- (d) Peripheral Sales.

(v) Type your opinion about our product

(vi) In your opinion, what is the status of our product ?

- (a) Excellent
- (b) Very good
- (c) Good
- (d) Fair
- (e) Not good
- (f) Bad
- (g) Very bad

Unit II

4. Which tools of multimedia could be implemented in

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2

designing a website ? Explain.

5. (i) How motion JPEG differ from MPEG ?

(ii) Write short notes on the following :

- (a) Image Maps
- (b) Image files and formats.

Unit III

6. Illustrate cascading style sheets and train properties.

7. Define style sheets. Explain, how a web-written controls the look and presentation of their document when viewed by web browsers using style sheets.

Unit IV

8. Write XML scheme for the following :

Music	Category	Quantity	Company
-------	----------	----------	---------

CD-ID Type Name Cost Name Singer

9. Consider an XML file which has an element called price and assume that XML document has ten records. Using DOM passer list all records where the price is more than ₹ 1,000.

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BSIT/M-18**12394****INTERNET CONCEPTS AND
APPLICATIONS-II****BSIT-604**

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory.

1. (a) Differentiate between cryptography and crypt analysis.
- (b) Name various multimedia compression schemes.
- (c) What is difference between EDI and paper based document transfer system ?
- (d) Differentiate between intranet and extranet. $4 \times 2 = 8$

Unit I

2. (a) Explain the concept of Encryption. 3,5
- (b) Explain DES method of Encryption.
3. Explain the steps to be taken to prevent infections in the computer. 8

Unit II

4. Explain various multimedia software tools in brief. 8
5. Explain briefly Hardware and Software requirements of Multimedia. 8

Unit III

6. What is EDI ? Explain the components of EDI. 8
7. Describe the security schemes adopted in SSL and SET. 8

Unit IV

8. Explain the planning needed for creation of Intranet. 8
9. Explain the various intranet services. 8

**EMBEDDED SYSTEM AND 8051 MICRO
CONTROLLER**

Paper-BSIT-605

Time allowed : 3 hours]

[Maximum marks : 40

Note :- Attempt five questions in all by selecting one question from each unit. Question number 1 is compulsory.

1. (i) Compare RISC with CISC. 3
(ii) Discuss bit assignment of PCON specific function register. 2
(iii) Draw timer / counter control logic of 8051. 2
(iv) What is the significance of Transmit flag TL, when it is cleared and set? 1

Unit-I

2. With the help of block diagram list various structural units of a processor and explain the function of each unit. 8
3. Explain with neat and clean diagram embedded system on chip (SOC) in detail. 8

Unit-II

4. (i) Discuss programming model of microcontroller 8051. 6
(ii) Draw pin diagram of IC 8051 2
5. (i) Discuss operating modes of 8051 timer. 6
(ii) Draw and explain bit pattern of SCON special function register 2

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Turnover

Unit-III

6. Explain Shift Register Mode, Standard UART Mode and Multiprocessor Mode with reference to serial data transmission. 8
7. (i) Explain various Addressing modes of 8051. 6
(ii) Draw and explain bit pattern of Program Status Word (PSW) special function Register. 2

Unit-IV

8. (i) Discuss various steps used for testing the design of 8051. 6
(ii) Explain Interrupt-driven program ie inidata. 2
9. (i) What is Asynchronous serial data transmission? 2
(ii) Explain, character transmission using time delay and Interrupt driven character transmission. 6

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