(ii) ugly (change into noun)

(iii) honest (change into noun)

(iv) He was standing ..... the table. (insert the correct preposition)

(v) He thrust the money ..... his pocket. (insert the correct preposition)

(vi) Go and sit ..... the room. (insert the correct preposition)

(vii) Quick (change into adverb)

(viii) Slow (change into adverb)

(ix) Sad (change into adverb)

(x) Give the synonym of: entire

(xi) Give the synonym of: calm

(xii) Give the synonym of: sad

(xiii) Give the antonym of: dead

(xiv) Give the antonym of: far

(xv) Give the antonym of: polite. 12

7. Write a paragraph of about 200 words on any *one* of the given topics :

(a) Girl Child.

(b) TV Serials.

(c) Mental Health.

(d) Friendship. 8

(1) Library

Roll No. ..... Total Pages : 4

GSE/D-19 **701**

ENGLISH

Time : Three Hours] [Maximum Marks : 80

1. Transcribe any *eight* of the given words :

Top, feet, air, gold, table, hot, girl, shirt, serve, father, window, gate. 8

2. Answer any *four* of the following questions in about 30 words each :

(a) What is the second element that makes up the identity of an individual?

(b) What does the 'World Tragedy' refer to?

(c) How did Gandhiji's faith in vegetarianism grow?

(d) How can one achieve excellence in life?

(e) According to Shastri ji, who is a good citizen?

(f) Where is Khyber Pass located? (4×2=8)

3. Answer any *five* of the following questions in 75 to 100 words each:

(a) Write about the positive side of rebelliousness.

(b) What is the result of the 'paralyzing effect'?

(c) How is the vision of a culture formed?

(d) Describe the relationship that Gandhi ji shared with his friend.

(e) According to Dr. Kalam, what influence does a story have on our mind?

(f) What is the importance of fostering a good work culture?

(g) Enumerate the various things that Nehru spoke to the peasants about.

(h) What do scriptures say about the origin of the Universe? (4×5=20)

4. Read the passage given below and answer the questions that follow :

Rebelliousness against parents is a natural, inevitable aspect of adolescence. It assists in giving up the comforts and security of home, achieving real independence, working for progress.

The most basic problem for the young person, though he doesn't really think of it in these terms, is to find his own identity, to find out what sort of person he really desires to be and to get started being a person. This doesn't mean just the specific job he'll take or the hobbies he'll enjoy. It means the kind of personality he'll end up with, how he'll be thought of by his friends, family and himself. It is not so much a matter of coming to conscious decisions – it's gaining a sense of being as an independent person, with a job to do.

(a) Who is the author of these lines?

(b) What is the most basic problem for a young person?

(c) What is the positive side of rebelliousness?

(d) What is the ultimate goal of a young person? 4

5. Make sentences of your own from any *eight* of the given words :

Dark, love, sin, work, never, suddenly, lost, force, book, shade, obey, defend 8

6. (a) Supply the correct form of the verbs given in brackets in any *twelve* :

(i) Who ..... your teacher? (be)

(ii) It ..... for three hours. (rain)

(iii) The earth ..... around the sun. (revolve)

(iv) I just ..... making that chart. (finish)

(v) Tomorrow, I ..... eight years in this house. (complete)

(vi) Be careful, you ..... too fast. (drive)

(vii) Yesterday, she ..... beautifully. (sing)

(viii) Love ..... blind. (be)

(ix) The theft ..... during the night. (happen)

(x) He always ..... a white shirt. (wear)

(xi) You are ordered to ..... at once. (leave)

(xii) Where ..... since morning? (be)

(xiii) Fifty million dollars ..... a lot of money. (be)

(xiv) Please don't ..... . (weep)

(xv) I will ..... as you say. (do) 12

(b) Do as directed (any *twelve*) :

(i) intelligent (change into noun)

Roll No. .....

Total Pages : 5

GSE/D-19

702

ENGLISH

Time : Three Hours]

[Maximum Marks : 80

Note : All questions are compulsory.

1. Give phonetic transcription of any *eight* of the following words:

Greet, food, duty, faith, prophet, sky, order, historical, enough, one, monkey, back. 08

2. Answer any *four* questions in about 30 words each: 08

(a) Describe Bumba. (Choosing Our Universe)

(b) Why is rebelliousness common in young people? (The Generation Gap)

(c) Can man be defined fully? (Language and National Identity)

(d) How can we realise the pain of the suffering of the mute? (The Wounded Plants)

(e) How did Gandhiji's faith in vegetarianism grow? (Playing the English Gentleman)

(f) What question did Nehru ask the crowd as they greeted him with slogans? (Bharat Mata)

3. Answer any *five* questions in about 75-100 words each : 2 c

(a) Discuss the note on which the essay "Are Dams the Temples of Modern India" ends.

(b) Justify the title "The Generation Gap".

(c) How is the vision of a culture formed? "Language and National Identity"

(d) What is the significance of the three series of investigation in the essay "Wounded Plants"?

(e) 'But henceforth I became a student': Explain the events and thoughts that led Gandhiji to arrive at this.

(f) What is the culture of excellence according to Dr Kalam?

(g) What is the importance of fostering a good work culture? (The Responsibility of Young Men)

(h) Who according to Nehru is Bharat Mata?

4. Read the given passage and answer the following questions:

Creation myths like these attempt to answer the questions we address... Why is there a universe, and why is the universe the way it is? Our ability to address such questions has grown steadily in the centuries since the ancient Greeks, most profoundly over the past century.... We are now ready to offer a possible answer to these questions.

Questions : 4

(a) Name the essay and the author.

(b) What ideas does the essay discuss?

(c) According to the myths, the first man originated ..... (complete the sentence)

(d) Form two words using the suffix '-ly'.

5. (a) Give synonyms of any *four* words: 04

Pain, begin, clarity, raise, urge, polite.

(b) Give anonyms of any *four* words: 04

Polite, obey, same, work, inferior, flow.

6. (a) Fill in the blanks with correct form of tense of the verbs given in brackets of any *twelve* sentences :

(i) Goats ..... (eat) grass.

(ii) Seema ..... (not drink) coffee.

(iii) The train ..... (leave) the platform.

(iv) They ..... (have) a few fights over this.

(v) My sister is a novelist. She ..... (write) novels since 2000.

(vi) Two plus two ..... (make) four.

(vii) How ..... you ..... (know) where I lived?

(viii) At last you are here! I ..... (wait) for you for over twenty minutes.

(ix) When Queen Victoria .....(die) in 1901, she (reign) for over 60 years.

(x) They ..... (go) home tomorrow.

(xi) Rajiv ..... (meet) us next month.

(xii) Sanjiv ..... (finish) his work by 7 pm tomorrow.

(xiii) By 2020, Dr. Sen .....(work) in this college for 30 years.

(xiv) The sun ..... (rise) in the east and ..... (set) in the west.

(xv) I ..... (be) a teacher.

(b) Do as directed. Attempt any *twelve* sentences. Insert correct preposition in the blank.

(i) I prefer tea ..... coffee.

(ii) Lalit jumped ..... the wall.

(iii) The shop is ..... my flat.

(iv) Air travel is a common mode ..... travel.

Rewrite the following sentences into their interrogative forms :

(v) Mohit studies every day.

(vi) Mohan plays football.

Fill in the blanks with suitable pronouns :

(vii) Something is better than .....

(viii) God helps those ..... help themselves.

(ix) I am doing ..... work.

Fill in the blanks with correct adjective :

(x) Ramesh is my ..... (old) brother.

(xi) Dhoni won the ..... (good) cricketer award.

(xii) We have invited (much/many) guests to the party.

Correct the following sentences if necessary :

(xiii) Rose smells sweetly.

(xiv) Firstly we should go to the canteen and then to our class.

(xv) Literature has no other purpose but entertainment.

7. Attempt a paragraph in about 200 words on any *one* of the given topics:

(a) My First Day in College.

(b) My Favourite Game.

(c) Women Empowerment.

(d) Elections in Haryana.

Roll No. .....

Total Pages : 3

GSE/D-19

707

हिन्दी (अनिवार्य)

Time : Three Hours]

[Maximum Marks : 80

नोट : सभी प्रश्नों के निर्देशानुसार उत्तर दीजिए।

1. किन्हीं **दो** पद्यांशों की सप्रसंग व्याख्या कीजिए:

(क) सतगुरू की महिमा अनँत, अनँत किया उपगार।
लोचन अनँत उघाड़िया, अनँत दिखावणहार।।

(ख) अविगत-गति कछु कहत न आवै।
ज्यों गूंगे मीठे फल कौ रस अन्तरगत ही भावै।
परम स्वाद सबही सु निरन्तर अमित तोष उपजावै।
मन-बानी कौ अगम-अगोचर, सो जानै जो पावैं।

(ग) माई म्हां गोबिन्द गुण गाणा।
राणां रूठ्यां नगरी त्यागां, हरि रूठ्यां कहं जाणां।
राणां भेज्या विषरो प्याला, चरणामृत पी जाणां।
काला नाग पिटारयां भेज्या, सालगराम पिछाणा।
मीरा तो अब प्रेम दिवांनी, सांवलिया वर पाणा।

(घ) मकराकृति गोपाल कैं सोहत कुण्डल कान।
धर्‌यौ मनौ हिय-घर समरू, डयौढी लसत निसान।।
बतरस-लालच लाल की मुरली धरी लुकाइ।
सौंहे करे, भौंहनु हँसै, दैन कहै नहि जाइ।। (6×2=12)

2. बिहारी **अथवा** कबीर में से किसी **एक** कवि का साहित्यिक परिचय दीजिए। 8

3. निम्न में से किन्हीं **चार** प्रश्नों के उत्तर लगभग 150 शब्दों में दीजिए: (4×4=16)

(क) घनानंद की बिरह-भावना पर प्रकाश डालिए।

(ख) कबीरदास ने अपनी साखियों में किसे और क्या चेतावनी दी है?

(ग) तुलसी की भक्ति-भावना पर प्रकाश डालिए।

(घ) बिहारी को शृंगारी कवि क्यों कहा गया है?

(ङ) घनानन्द को 'प्रेम की पीर' का कवि क्यों कहा जाता है?

(च) तुलसीदास की सामाजिक चेतना का वर्णन कीजिए।

4. निम्नलिखित में से किन्हीं **दो** प्रश्नों के उत्तर दीजिए:

(क) हिन्दी साहित्य के इतिहास लेखन की परम्परा पर प्रकाश डालिए।

(ख) आदिकाल की प्रमुख विशेषताएँ स्पष्ट कीजिए।

(ग) आदिकाल की सामाजिक, राजनैतिक और धार्मिक परिस्थितियों का परिचय दीजिए।

(घ) रासो काव्य परम्परा पर एक लेख लिखिए। (8×2=16)

5. किन्हीं **दो** प्रश्नों के उत्तर दीजिए:

(क) क्या आदिकाल को चरणकाल कहना उचित है?

(ख) आदिकालीन वीर काव्यों की भाषा-शैली पर प्रकाश डालिए।

(ग) हिन्दी साहित्य के इतिहास के काल-विभाजन का प्रयास किन-किन विद्वानों ने किया?

(घ) आदिकाल की सीमा निर्धारण पर समीक्षा कीजिए। (5×2=10)

6. निम्न में से **दो** प्रश्नों के उत्तर दीजिए:

(क) शृंगारी रस की परिभाषा एवं उदाहरण दीजिए।

(ख) उत्प्रेक्षा अलंकार की परिभाषा एवं उदाहरण दीजिए।

(ग) लक्षणा शब्द भक्ति किसे कहते हैं। उदाहरण सहित स्पष्ट कीजिए।

(घ) प्रसाद गुण को स्पष्ट कीजिए। (5×2=10)

7. निम्नलिखित वस्तुनिष्ठ प्रश्नों के उत्तर दीजिए:

(क) 'पृथ्वीराज रासो' किस कवि की रचना है?

(ख) रसखान का पूरा नाम क्या था?

(ग) घनानंद का प्रिय छन्द कौन-सा है?

(घ) 'बिहारी सतसई' के रचयिता कौन हैं?

(ङ) कवितावली में कुल कितने काण्ड हैं?

(च) सूरदास के गुरू का क्या नाम था?

(छ) 'शौक' किस रस का स्थायी भाव होता है?

(ज) छंद कितने प्रकार के होते हैं? 8

8. किन्हीं **दो** प्रश्नों के उत्तर संक्षेप में दीजिए :

(क) अमीर खुसरो की पहेलियों पर टिप्पणी करें।

(ख) आदिकाल में सिद्ध साहित्य पर टिप्पणी करें।

(ग) विद्यापति के काव्य की प्रवृत्तियाँ बताएँ।

(घ) आदिकाल की सामाजिक परिस्थितियों का चित्रण कीजिए।

(4+4=8)

9. सभी प्रश्नों के उत्तर दीजिए :

(क) कात्या की बेटी का नाम क्या है?

(ख) कुरूक्षेत्र के काव्य रूप का नाम बताइए।

(ग) आदिकाल को बीजवपन काल किसने कहा था?

(घ) 'गोरखबानी' के सम्पादक कौन हैं?

(ङ) श्रावकाचार के रचयिता का क्या नाम है?

(च) हिंदी का प्रथम महाकाव्य किसे माना जाता है?

(छ) जगनिक द्वारा रचित वीर रस प्रधान ग्रन्थ का नाम क्या है?

(ज) 'कुरूक्षेत्र' की रचयिता और प्रकाशन कब हुआ?

(1+8=8)

Roll No. ..... Total Pages : 4

GSE/D-19 **708**

HINDI

(Elective)

Time : Three Hours] [Maximum Marks : 80

1. निम्नलिखित पद्यांशों में से किन्हीं **दो** की सप्रसंग व्याख्या कीजिए :

(क) नाम सुन भूलो नहीं सोचो-विचारो कृत्य;
यह मनुज, संहार-सेवी वासना का भृत्य।
छदम् इसकी कल्पना, पाखण्ड इसका ज्ञान,
यह मनुष्य मनुष्यता का घोरतम अपमान

(ख) बुद्धि के पवमान में उड़ता हुआ असहाय
जा रहा तू किस दिशा की ओर को निरूपाय?
लक्ष्य क्या? उद्देश्य क्या? क्या अर्थ
यह नहीं यदि ज्ञात, जो विज्ञान का श्रम व्यर्थ।

(ग) जो जीव बुद्धि-अधीर
तोड़ना अणु ही, न इस व्यवधान का प्राचीर;
वह नहीं मानव, मनुज से उच्च, लघु या भिन्न
चित्र-प्राणी है किसी अज्ञात ग्रह का छिन्न।

(घ) साम्य की वह रश्मि स्निग्ध, उदार,
कब खिलेगी, कब खिलेगी विश्व में भगवान?
कब सुकोमल ज्योति से अभिसिक्त
हो, सरस होंगे जली सूखी रसा के प्राण। (4+4)

2. 'कुरूक्षेत्र' की मूल संवेदना पर प्रकाश डालिए।

अथवा

कुरूक्षेत्र के काव्यरूप पर प्रकाश डालिए। (1×8=8)

3. किन्हीं **दो** प्रश्नों के उत्तर दीजिए :

(क) कुरूक्षेत्र के आधार पर युधिष्ठिर की चरित्रगत विशेषताओं का वर्णन करें।

(ख) कुरूक्षेत्र के छठे सर्ग में आधार पर आधुनिक मनुष्य की विशेषताएँ बताएं।

(ग) कुरूक्षेत्र के स्वभाव पर प्रकाश डालिए।

(घ) कुरूक्षेत्र की भाषा-शैली पर प्रकाश डालिए। (3+3=6)

4. निम्नलिखित गद्यावतरणों में से **दो** की सप्रसंग व्याख्या कीजिए।

(क) सूरज और चाँद ही भगवान की दी हुई घड़ियां हैं। जब भगवान ने घड़ी नहीं बनाई तो इन्सान का घड़ी बनाने का मतलब ही क्या है? उस वक्त तो यों कहता था।

(ख) सारा वक्त पीछे की ओर ही नहीं देखते रहते, कात्या। कभी भविष्य की ओर भी देखना चाहिए। सयाने कह गए हैं– पीठ अतीत की ओर और मुँह भविष्य की ओर होना चाहिए।

(ग) सिर्फ पीतल की कमानी बनाओ तो बड़ी जल्दी टूट जाती है। कमानी तो ऐसी होनी चाहिए जो बोझ को बर्दाश्त करने पर लचक जाए, मगर टूटे नहीं। यह बन रहा है।

(घ) बस, यही घड़ी बन रही है। इसे मेरे दोस्त बना रहे हैं। यहीं इस घर में रहते हैं। इन्हीं का नाम हानूश है। मगर लोहार, जिससे तुम मिलने आए हो, यहाँ पर नहीं है। वह अभी-अभी यहाँ से गया है। (4×2=8)

5. 'हानूश' नाटक के आधार पर कात्या के चरित्र पर प्रकाश डालिए।

अथवा

'हानूश' नाटक का उद्देश्य लिखिए। (1×8=8)

6. किन्हीं **दो** प्रश्नों के उत्तर दीजिए :

(क) हानूश नाटक की पात्र योजना पर संक्षिप्त टिप्पणी लिखिए।

(ख) हानूश नाटक की अभिनेयता पर प्रकाश डालिए।

(ग) हानूश नाटक की भाषा-शैली का चित्रण कीजिए।

(घ) हानूश के प्रतिपाद्य की विवेचना कीजिए। (2×4=8)

7. निम्नलिखित में से **दो** के उत्तर दीजिए :

(क) आदिकाल की परिस्थितियों पर प्रकाश डालिए।

(ख) आदिकाल की प्रवृत्तियों पर प्रकाश डालिए।

(ग) रासो काव्य परंपरा के बारे में लिखिए।

(घ) आदिकाल के नामकरण और काल विभाजन पर चर्चा कीजिए।

(9+9=18)

9. ਸਰਦਾਰ ਅਤਰ ਸਿੰਘ ਕਿਹੋ ਜਿਹਾ ਵਿਅਕਤੀ ਸੀ?

(ੳ) ਲਾਲਚੀ

(ਅ) ਕੰਜੂਸ

(ੲ) ਮਾਇਆਧਾਰੀ ਅਤੇ ਮਹਾਂ ਕੰਜੂਸ

(ਸ) ਲੋਕਾਂ ਦਾ ਖ਼ੂਨ ਪੀਣ ਵਾਲਾ

10. ਕਿਦਾਰ ਕੀ ਕੰਮ ਕਰਦਾ ਸੀ?

(ੳ) ਘੜੀ-ਸਾਜ਼ੀ (ਅ) ਸਮਾਜ-ਸੇਵੀ

(ੲ) ਅਧਿਆਪਕੀ (ਸ) ਕਲਰਕੀ। 10

Roll No. ..... Total Pages : 8

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GSE/D–19

PUNJABI (E)

Time : Three Hours] [Maximum Marks : 80

ਨੋਟ : ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਜ਼ਰੂਰੀ ਹਨ।

1. ਹੇਠ ਲਿਖਿਆਂ ਕਵੀਆਂ ਵਿਚੋਂ ਕਿਸੇ *ਇਕ* ਕਵੀ ਦੇ ਜੀਵਨ ਅਤੇ ਰਚਨਾ ਦ੍ਰਿਸ਼ਟੀ ਉਪਰ ਨਿਬੰਧ ਲਿਖੋ :

(ੳ) ਭਾਈ ਵੀਰ ਸਿੰਘ

(ਅ) ਡਾ: ਹਰਿਭਜਨ ਸਿੰਘ

(ੲ) ਬਾਵਾ ਬਲਵੰਤ। 5

2. ਹੇਠ ਲਿਖੇ ਕਾਵਿ-ਟੋਟਿਆਂ ਵਿਚੋਂ ਕਿਸੇ *ਦੋ* ਦੀ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ ਕਰੋ :

(ੳ) ਹੋਈ ਹਾਂ ਸਵਾਦ ਸਾਰੀ,
ਆਪੇ ਤੋਂ ਮੈਂ ਆਪ ਵਾਰੀ,
ਅੱਸੀ ਰਸ ਭਰੀ ਹੋਈ,
ਸਵਾਦ ਸਾਰੇ ਧਾ ਗਿਆ।

(ਅ) ਹੁਣ ਵੀ ਜਦ ਠਿਕਰਾਂ ਦਾ ਪਾਣੀ
ਗਮਾਂ ਦੁਖਾਂ ਹੰਝੂਆਂ ਦਾ ਪਾਣੀ
ਚੜ੍ਹਦਾ ਆਵੇ ਲਕ ਲਕ ਤਾਣੀ, ਗਲ ਗਲ ਤਾਣੀ
ਸਿਰ ਸਿਰ ਤਾਣੀ
ਝੱਗ ਵਗਾਂਦਾ, ਪੈਰ ਉਖੜਾਂਦਾ
ਸਿਰ ਤੇ ਚੁੱਮੀ, ਪੰਡ ਘਾਹ ਦੀ
ਪੈਲਾ ਪਾਂਦੀ, ਝੋਲੇ ਖਾਂਦੀ।

(ੲ) ਫਿਰ ਵਿੱਥਾਂ ਲਿੱਪੀ ਜ਼ਬਾਨ ਦੀਆਂ,
ਫਿਰ ਪਹਿਰਾਵੇ ਤੇ ਵੇਸ ਦੀਆਂ,
ਫਿਰ ਸਭਿਤਾ, ਸਭਿਆਚਾਰ ਦੀਆਂ,
ਫਿਰ ਦੇਸ ਅਤੇ ਪਰਦੇਸ ਦੀਆਂ।

(ਸ) ਰੋਜ ਉਸਦਾ ਹਾਰ ਟੁੱਟ ਜਾਇਆ ਕਰੇ,
ਮੁਸਕਰਾਂਦੀ ਆ ਕੇ ਬਣਵਾਇਆ ਕਰੇ।
ਮੇਰੇ ਪੁੱਛਣ ਤੇ ਕਿ ਟੁੱਟਾ ਕਿਸ ਤਰ੍ਹਾਂ?
ਪਾ ਕੇਵਲ ਗਰਦਨ ਨੂੰ ਸਰਮਾਇਆ ਕਰੇ।
ਮੇਰੇ ਸਿਰ ਸਾਇਆ ਕਰੇ ਖੁਸ਼ਬੂ ਦੀ ਸ਼ਾਖ,
ਉਹ ਜੋ ਉਸ ਦੇ ਮੂੰਹ ਤੇ ਲਹਿਰਾਇਆ ਕਰੇ।

5+5=10

3. ਨਾਨਕ ਸਿੰਘ ਦਾ ਪੰਜਾਬੀ ਨਾਵਲ ਵਿਚ ਕੀ ਸਥਾਨ ਹੈ? ਸੰਖੇਪ ਵਿਚ ਇਕ ਨਿਬੰਧ ਲਿਖੋ। 5

4. 'ਪਵਿੱਤਰ ਪਾਪੀ' ਨਾਵਲ ਦੇ ਵਿਸ਼ੇ-ਵਸਤੂ ਉਪਰ ਲੇਖ ਲਿਖੋ।

ਜਾਂ

'ਪਵਿੱਤਰ ਪਾਪੀ' ਨਾਵਲ ਦੇ ਦੋ ਪ੍ਰਮੁੱਖ ਪਾਤਰਾਂ ਦਾ ਚਰਿਤਰ ਚਿਤਰਣ ਕਰੋ। 10

5. ਆਪਣੇ ਜ਼ਿਲੇ ਦੇ ਡਿਪਟੀ-ਕਮੀਸ਼ਨਰ ਨੂੰ ਇਕ ਚਿੱਠੀ ਲਿਖੋ, ਜਿਸ ਵਿਚ ਸਰਕਾਰ ਵੱਲੋਂ ਲਗਾਏ ਗਏ ਦਿਸ਼ਾ-ਨਿਰਦੇਸ਼ਾਂ ਦੇ ਬੋਰਡਾਂ ਉਤੇ ਅੰਗ੍ਰੇਜ਼ੀ/ਹਿੰਦੀ ਦੇ ਨਾਲ ਨਾਲ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਵਰਤੋਂ ਕਰਨ ਦੀ ਬੇਨਤੀ ਕੀਤੀ ਜਾਵੇ।

ਜਾਂ

ਸਕੂਲ ਦੇ ਪ੍ਰਿੰਸੀਪਲ ਨੂੰ ਆਪਣੇ ਘਰ ਦੀ ਆਰਥਿਕ ਹਾਲਾਤ ਬਿਆਨ ਕਰਦੇ ਹੋਏ ਫੀਸ-ਮੁਆਫੀ ਬਾਰੇ ਬਿਨੈ-ਪੱਤਰ ਲਿਖੋ।

10

6. ਹੇਠ ਲਿਖੇ ਮੁਹਾਵਰਿਆਂ ਵਿਚੋਂ ਕਿਸੇ *ਦਸ* ਦੇ ਅਰਥ ਦੱਸ ਕੇ ਵਾਕਾਂ ਵਿਚ ਵਰਤੋ :

1. ਉੱਲੂ ਸਿੱਧਾ ਕਰਨਾ
2. ਉੱਨ ਲਾਹੁਣੀ
3. ਅੱਗ ਨਾਲ ਖੇਡਣਾ
4. ਹੱਥ ਅੱਡਣਾ
5. ਗੁੱਡੀ ਚੜ੍ਹਣੀ
6. ਘਿਉ ਖਿੱਚੜੀ ਹੋਣਾ
7. ਚਿੜੀ ਨਾ ਫਟਕਣੀ
8. ਚਾਦਰ ਪਾਉਣੀ
9. ਚੰਨ ਚਾੜ੍ਹਨਾ
10. ਛਾਤੀ ਤੇ ਮੂੰਗ ਦਲਣਾ
11. ਝੱਖ ਮਾਰਨਾ
12. ਠੰਡੇ ਸਾਹ ਭਰਨਾ
13. ਥੁੱਕ ਕੇ ਚੱਟਣਾ। 10

7. ਹੇਠ ਲਿਖੇ ਸ਼ਬਦਾਂ ਵਿਚੋਂ (ਅਸ਼ੁੱਧ) *ਦਸ* ਨੂੰ ਸ਼ੁੱਧ ਕਰਕੇ ਲਿਖੋ :

1. ਅੰਬਰ
2. ਕਵਿ
3. ਤਾਂਗ
4. ਡੂੰਗਾ
5. ਮਿਨਤੀ
6. ਸਬ

7. ਤੀਸੀਂ
8. ਜਾਲਮ
9. ਬਲਿ
10. ਨਾਯਦ
11. ਸਿਦਾਂਤ
12. ਨੰਬਰ। 10

8. ਹੇਠ ਲਿਖੀ ਪ੍ਰਬੰਧਕੀ ਸ਼ਬਦਾਵਲੀ ਵਿਚੋਂ *ਦਸ* ਅੰਗਰੇਜ਼ੀ ਸ਼ਬਦਾਂ ਦੇ ਸਮਾਨਾਰਥੀ ਪੰਜਾਬੀ ਸ਼ਬਦ ਲਿਖੋ :

1. Allocation
2. Applicant
3. Arrears
4. Basic pay
5. Cash book
6. Circular
7. Compliance
8. Confidential
9. Cost price
10. Daily wages
11. Document
12. Estimate
13. Enclosure
14. Eligible
15. Dearness allowance 10

9. ਹੇਠ ਲਿਖੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਬਹੁ-ਵਿਕਲਪਾਂ ਵਿਚੋਂ ਠੀਕ ਉੱਤਰ ਚੁਣ ਕੇ ਆਪਣੀ ਉੱਤਰ-ਕਾਪੀ ਵਿਚ ਲਿਖੋ :

1. 'ਅਣਡਿੱਠਾ ਰਸ ਦਾਤਾ' ਕਵਿਤਾ ਦਾ ਲੇਖਕ ਕੌਣ ਹੈ?

(ੳ) ਪ੍ਰੋ: ਪੂਰਨ ਸਿੰਘ (ਅ) ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ

(ੲ) ਭਾਈ ਵੀਰ ਸਿੰਘ (ਸ) ਭਾਈ ਮੋਹਨ ਸਿੰਘ ਵੱਦ

2. 'ਬਸੰਤ' ਕਵਿਤਾ ਵਿਚ ਕੁਦਰਤ ਕਿਸ ਰੂਪ ਵਿਚ ਪੇਸ਼ ਹੋਈ ਹੈ?

(ੳ) ਮਾਨਵੀਕਰਨ (ਅ) ਦੇਸ਼ ਪਿਆਰ

(ੲ) ਕੁਦਰਤ ਪਿਆਰ (ਸ) ਰੁਮਾਂਟਿਕ

3. 'ਅੰਬੀ ਦੇ ਬੂਟੇ ਥੱਲੇ' ਕਵਿਤਾ ਕਿਸ ਪ੍ਰਕਾਰ ਦੀ ਹੈ?

(ੳ) ਪ੍ਰਗਤੀਵਾਦੀ (ਅ) ਰਹੱਸਵਾਦੀ

(ੲ) ਛਾਇਆਵਾਦੀ (ਸ) ਰੁਮਾਂਟਿਕ

4. 'ਬਾਵਾ ਬਲਵੰਤ' ਹੇਠ ਲਿਖੀ ਕਿਸ ਕਵਿਤਾ ਦਾ ਲੇਖਕ ਹੈ?

(ੳ) ਬਸੰਤ (ਅ) ਕੁਦਰਤ

(ੲ) ਉਸ ਦਾ ਹਾਰ (ਸ) ਫ਼ਰਦ

5. 'ਸੜਕ ਦੇ ਸਫ਼ੇਤੇ' ਕਵਿਤਾ ਦਾ ਕਵੀ ਕੌਣ ਹੈ?

(ੳ) ਭਾਈ ਵੀਰ ਸਿੰਘ (ਅ) ਪ੍ਰੋ: ਮੋਹਨ ਸਿੰਘ

(ੲ) ਹਰਿਭਜਨ ਸਿੰਘ (ਸ) ਬਾਵਾ ਬਲਵੰਤ

6. ਪੰਜਾਬੀ ਵਿਚ ਸਭ ਤੋਂ ਵੱਧ ਨਾਵਲ ਲਿਖਣ ਵਾਲੇ ਨਾਵਲਕਾਰ ਦਾ ਨਾਂ ਦੱਸੋ

(ੳ) ਜਸਵੰਤ ਸਿੰਘ ਕੰਵਲ (ਅ) ਨਾਨਕ ਸਿੰਘ

(ੲ) ਨਰਿੰਦਰਪਾਲ ਸਿੰਘ (ਸ) ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ

7. 'ਪਵਿੱਤਰ ਪਾਪੀ' ਨਾਵਲ ਦਾ ਮੁੱਖ ਪਾਤਰ ਕੌਣ ਹੈ?

(ੳ) ਪੰਨਾ ਲਾਲ (ਅ) ਕਿਦਾਰ

(ੲ) ਅਤਰ ਸਿੰਘ (ਸ) ਕੋਈ ਵੀ ਨਹੀਂ

8. 'ਪਵਿੱਤਰ ਪਾਪੀ' ਨਾਵਲ ਵਿਚਲੇ ਪਾਤਰ ਕਿਸ ਸ਼੍ਰੇਣੀ ਨਾਲ ਸਬੰਧਿਤ ਹਨ?

(ੳ) ਮੱਧ ਵਰਗ (ਅ) ਉੱਚ ਵਰਗ

(ੲ) ਹੇਠਲੀ ਸ਼੍ਰੇਣੀ (ਸ) ਸਰਮਾਇਦਾਰ

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SANSKRIT

(Compulsory)

Time : Three Hours]

[Maximum Marks : 80

नोट : सभी प्रश्न अनिवार्य हैं।

1. निम्नलिखित प्रश्नों के उत्तर **दो-तीन** पंक्तियों में दीजिए: (2×8=16)

(क) 'वयं त्वां भजामः' पाठ किस ग्रन्थ से लिया गया है। इसके रचयिता का नाम भी लिखिए।

(ख) सीता ने रावण को जो उपदेश दिए उनमें से काई दो संक्षेप में लिखिए।

(ग) 'सद्वृत्तम' पाठ कौन से ग्रन्थ से लिया गया है तथा रचयिता का नाम भी लिखिए।

(घ) सुन्द, उपसुन्द कौन थे, वर माँगते समय उनके मुख से अन्यथा क्यों निकल गया।

(ङ) 'पितृ' वे 'विद्वस,' की प्रथमा विभक्ति लिखिए।

(च) √प्रच्छ धातु का लृट् लकार तीनों वचनों व पुरुषों में लिखिए।

(छ) अच् सन्धि की परिभाषा लिखकर उदाहरण भी दीजिए।

(ज) 'श्रीमद् भगवद्गीता' के रचयिता कौन हैं? यह किसने किसको कही थी?

(ख) निम्नलिखित में से किन्हीं **चार** का सन्धि-विच्छेद कीजिए:

कपीशः, सप्तर्षिः, तथैव, यद्यपि, नायकः, गव्यम्, प्रेजते। (1×4=4)

6. श्रीमद्भगवद्गीता से कण्ठस्थ **चार** श्लोकों का शुद्ध लेखन कीजिए, जो प्रश्नपत्र में पूछे गए श्लोकों से भिन्न हों।

2. (क) निम्नलिखित में से किन्हीं **दो** श्लोकों का सप्रसंग सरलार्थ कीजिए: (5×2=10)

(i) बलमसि बलं मयि धेहि, ओजोऽस्योजो मयि धेहि।
मन्युरसि मन्युं मयि धेहि, सहोऽसि सहो मयि धेहि।।

(ii) यथा वै भरतो मान्यस्तथा भूयोऽपि राघवः।
कौसल्यातोऽतिरिक्तं च मम शुश्रूषते बहु।

(iii) गतः सेतु सुनीतानां गतो धर्मस्य विग्रहः।
गतः सत्त्वस्य संक्षेपः सुहस्तानां गतिर्गता।।

(ख) 'धिग् दारिद्र्यम्' **अथवा** 'विभीषणस्य विलापः' पाठ का सार अपने शब्दों में लिखिए। 6

3. (क) निम्नलिखित में से किन्हीं **दो** गद्यांशों का सप्रसंग सरलार्थ लिखिए:

(i) यान्यनवद्यानि कर्माणि तानि सेवितव्यानि, नो इतराणि। यान्यस्माकं सुचरितानि तानि त्वयोपास्यानि, नो इतराणि। ये के चास्मच्छ्रेयांसो ब्राह्मणाः तेषां त्वयाऽसनेन प्रश्वसितव्यम्। श्रद्धया देयम्। अश्रद्धयाऽदेयम्। श्रेया देयम्। ह्रिया देयम्। भिया देयम्। संविदा देयम्।

(ii) स्वामिन्, किमनेन सकलमृगवधेन नित्यमेव, यतस्तवैकेनापि मृगेण तृप्तिर्भवति तत्क्रियतामस्माभिः सह समयधर्मः। अद्य प्रभृति तवात्रोपविष्टस्य जाति-क्रमेण प्रतिदिनमेको मृगो भक्षणार्थं समेष्यति एवं कृते तव तावत्प्राणयात्रा क्लेशं विनापि भविष्यति, अस्माकं च पुनः सर्वोच्छेदनं न स्यात्।

(iii) एकत्र वृक्षे काकवर्त्तकौ सुखं निवसतः। एकदा भगवतो गरूडस्य यात्राप्रसंगेन सर्वे पक्षिणः समुद्रतीरङ्गताः। ततः काकेन सह वर्त्तकश्चलितः। अथ गच्छतो गोपालस्य मस्तकाऽवस्थितदधिभाण्डा-द्वारं वारं तेन काकेन दधि खाद्यते। यतो यावदसौ दधिभाण्डं भूमौ निधायोर्ध्वमवलोकते, तावत्तेन काकवर्त्तकौ दृष्टौ।

(ख) 'पराधिकारचर्चां परिवर्जयेत्' **अथवा** 'नीलवर्णः शृगालः' पाठ का सार अपने शब्दों में लिखिए। 6

4. (क) निम्नलिखित में से किन्हीं **तीन** शब्दों की यथोक्त विभक्तियाँ लिखिए: (3×3=9)

बालक-पञ्चमी, सप्तमी; साधु-प्रथमा, तृतीया; मातृ-द्वितीया, चतुर्थी; कवि-षष्ठी, सप्तमी; शशिन्-प्रथमा, चतुर्थी।

(ख) निम्नलिखित में से किन्हीं **तीन** धातुओं का यथोक्त लकार तीनों वचनों व पुरुषों में लिखिए: (3×3=9)

√स्था-लट्, √लभ्-लङ्, √भू-लृट्, यच्छ्-विधिलिङ्, √वद्-लोट् लकार।

5. (क) निम्नलिखित में से किन्हीं **चार** में सन्धि कीजिए:

भानु+उदयः, गण+ईशः, एक+एकशः, दधि+अत्र, पौ+अकः, अग्ने+अत्र, प्र+ओषति। (1×4=4)

Roll No. .....

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संस्कृत

(ऐच्छिक)

Time : Three Hours]

[Maximum Marks : 80

1. सभी प्रश्नों के उत्तर दीजिए:

(क) 'हितोपदेश' के रचयिता का नाम लिखिए।

(ख) 'कपोतराज' का नाम लिखिए।

(ग) 'नीति शतक' के लेखक का नाम लिखिए।

(घ) विद्या-हीन मनुष्य कैसा होता है?

(ङ) 'कवय:' किस विभक्ति और वचन का रूप है?

(च) 'भव' के लकार पुरुष वचन लिखिए।

(छ) 'अच् सन्धि' के **दो** उदाहरण लिखिए।

(ज) हल् सन्धि के **दो** उदाहरण लिखिए। (8×2=16)

2. (I) किन्हीं **दो** का सरलार्थ कीजिए:

(क) विद्या ददाति विनयं विनयाद, याति पात्रताम्।
पात्रत्वाद, धनभाप्नोति धनाद, धर्मं तत: सुखम्।।

(ख) यथा ह्येकेन चक्रेण न रथस्य गति र्भवेत्।
एवं पुरुष कारेण विना दैवं न सिध्यति।।

(ग) यानि कानि च मित्राणि कर्तव्यानि शतानि च।
पश्य मूषकमित्रेण कपोतामुक्त-बन्धना:।।

(घ) इति विचिन्त्य पक्षिण सर्वे जालमादाय उत्पतिताः। अनन्तरं स व्याघः जालापहारकान् तान् अक्लोक्य पश्चाद, धावन् अचिन्तयत्। (2×5=10)

(II) गिद्ध-भार्जार **अथवा** मृग-शृगाल की कथा लिखिए। 6

3. (I) किन्हीं **दो** श्लोकों का सरलार्थ कीजिए:

(क) विद्या नाम नरस्य रूपमधिकं प्रच्छन्नगुप्तं धनं:
विद्या भोगकरी यशः सुखकरी विद्या गुरूणां गुरुः।
विद्या बन्धुजनो विदेश गमने विद्या परा देवता;
विद्या राजसु पूज्यते न हि धनं विद्या-विहीनः पशुः।।

(ख) परिवर्तिनि संसारे मृतः को वा न जायते।
स जातो येन जातेन याति वंशः समुन्नतिम्।।

(ग) यस्यास्ति वित्तं स नरः कुलीनः
स पण्डितः स श्रुतवान् गुणज्ञः।
स एव वक्ता स च दर्शनीयः
सर्वे गुणः काञ्चन माश्रयन्ते।।

(घ) सत्याऽनृता च परुपा प्रियवादिनी च;
हिंस्रा दयालुरपि चार्थपरा वदान्य।।
नित्यव्यथा प्रचुर-वित्त समागमा च;
वारांगनेव नृपनी तिरने क रूपा।।
(2×5=10)

(II) किसी **एक** सूक्ति की सप्रसंग व्याख्या कीजिए:

(क) सत्संगतिः कथय किं न करोति पुंसाम्।

(ख) विभूषणं मौनं अपण्डितानाम्। 6

4. (क) **दो** शब्दों के निर्दिष्ट विभक्तियों में रूप लिखिए:

(i) लता-तृतीया सप्तमी।

(ii) अस्मद्-द्वितीया-षष्ठी।

(iii) राम-पञ्चमी-सम्बोधन।

(iv) कवि-प्रथमा-चतुर्थी। (2×4=8)

(ख) **दो** धातुओं के निर्दिष्ट लकारों में रूप लिखिए:

(i) भू-लोट्

(ii) कृ-लृट्

(iii) गम्-लङ्

(iv) नम्-लट्। (2×4=8)

5. (क) किन्हीं **चार** की सन्धि कीजिए:

शिव + आलयः, उमा + ईशः
सूर्य + उदयः, यदि + अपि, तथा + एव
नै + अकः, वाक् + ईशः, नमः + ते। 4

(ख) किन्हीं **चार** का विच्छेद कीजिए:

हरीशः, हितोपदेशः, देवालयः, प्रत्येकम्, चैव, पावकः, जगदीशः, सज्जनः 4

(ग) **दो** श्लोक लिखिए, जो प्रश्न-पत्र में न हों। (2×4=8)

Total Pages : 7

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GSE/D-19

ECONOMICS

(Micro Economics-I)

[Maximum Marks : 80

: Three Hours]

: Question No. 1 and 2 are compulsory. In all do *five* questions, selecting *one* question each from any three units.

: प्रश्न नं. 1 व 2 अनिवार्य हैं। कुल **पाँच** प्रश्न कीजिए। शेष **तीन** प्रश्न किन्हीं तीन इकाइयों में से एक प्रश्न चुनते हुए कीजिए।

1. Case Study

Following are the different possibilities of production of wheat and rice :

Good	A	B	C	D	E
Wheat	10	9	7	4	0
Rice	0	1	2	3	4

(a) On this basis, draw production possibility curve and also tell the meaning of it.

(b) Define marginal opportunity cost and show it in diagram.

(c) Mention the factors which will cause an upward shift in the production possibility curve.

(d) How can the central problems of the economy be solved with the help of a production possibility. (4×4=16)

[P.T.O.

केस स्टडी

गेहू और चावल के उत्पादन की विभिन्न सम्भावनाएं निम्न दी गई हैं :

वस्तु	A	B	C	D	E
गेहूँ	10	9	7	4	0
चावल	0	1	2	3	4

(क) इस आधार पर उत्पादन सम्भावना वक्र बनाइए और इस वक्र का अर्थ भी बताइए।

(ख) सीमान्त अवसर लागत की परिभाषा दें और इसे चित्र में दिखाइए।

(ग) उन तत्वों को बताइए जिनसे उत्पादन सम्भावना वक्र को ऊपर हस्तांरित किया जा सकता है।

(घ) उत्पादन सम्भावना वक्र से किस प्रकार से अर्थव्यवस्था की मुख्य समस्याओं का समाधान किया जा सकता है।

2. (I) Choose the correct answer :

सही उत्तर चुनें :

(i) In case of substitutes, the cross elasticity of demand is

(a) Negative

(b) Zero

(c) Positive

(d) Equal to one.

प्रतिस्थापन्न वस्तुओं की मांग की आड़ी लोच होती है

(क) ऋणात्मक

(ख) शून्य

(ग) धनात्मक

(घ) इकाई के बराबर।

(ii) Price mechanism is the feature of

(a) Socialism

(b) Mixed economy

(c) Capitalism

(d) None of these.

कीमत संयंत्र विशेषता है

(क) समाजवाद

(ख) मिश्रित अर्थव्यवस्था

(ग) पूंजीवाद

(घ) इनमें से कोई नहीं।

(iii) When demand curve is parallel to x-axis, then price elasticity of demand is

(a) Unity

(b) Zero

(c) Greater than unity

(d) Infinity.

जब मांग वक्र x-अक्ष के समान्तर होता है, उस समय मांग की कीमत लोच होती है

(क) इकाई

(ख) शून्य

(ग) इकाई से अधिक

(घ) अनन्त (∞)।

(iv) All factors are variable in

(a) Short period

(b) Long period

(c) Very short period

(d) All of these.

सभी साधन परिवर्तनशील होते हैं

(क) अल्पकाल में

(ख) दीर्घकाल में

(ग) अति अल्पकाल में

(घ) इन सभी में।

(v) Slope of isoquant is

(a) $\frac{\Delta K}{\Delta L}$

(b) $\frac{\Delta X}{\Delta Y}$

(c) $\frac{\Delta L}{\Delta K}$

(d) $\frac{L}{K}$.

(5×1=5)

सम उत्पादन वक्र का ढलान होता है

(क) $\frac{\Delta K}{\Delta L}$

(ख) $\frac{\Delta X}{\Delta Y}$

(ग) $\frac{\Delta L}{\Delta K}$

(घ) $\frac{L}{K}$.

(II) Match the following :

1. Alfred Marshall	1. Unitary elastic
2. Mixed economy	2. Paradox of Poverty
3. Unchanged total expenditure	3. Principles of Economics
4. More production leads to less income	4. Family of Isoquant curves
5. Isoquant map	5. Coexistence of private and public sector

(5×1=5)

मिलान करें :

1. अल्फ्रेड मार्शल	1. इकाई लोच
2. मिश्रित अर्थव्यवस्था	2. निर्धनता का विरोधाभास
3. अपरिवर्तित कुल खर्च	3. Principles of Economics

4. अधिक उत्पादन से कम आय होना
4. सम उत्पादन वक्रों का परिवार
5. सम उत्पादन मानचित्र
5. सरकारी व निजी क्षेत्रों का पाया जाना।

(III) Define the following :

(a) Define Ridge lines *or* Income Elasticity of Demand.

(b) How price elasticity of demand is calculated by point method.

(c) What is break even point ? (3×2=6)

निम्न कारणों का अर्थ बताइए :

(क) ऋजु रेखाओं (Ridge Lines) की परिभाषा दें या मांग की आय लोच की परिभाषा दें।

(ख) किस प्रकार बिन्दु रीति (Point Method) से मांग की कीमत लोच को मापा जाता है।

(ग) लाभ अर्जन स्थिति किसे कहते हैं?

UNIT–I (इकाई–I)

3. Explain the law of demand. What factors affect demand ?

मांग के नियम का वर्णन करें। मांग को प्रभावित करने वाले तत्व कौन-से हैं?

4. Is Economics a science *or* an art ? Discuss. 16

अर्थशास्त्र विज्ञान है या कला? व्याख्या कीजिए।

UNIT–II (इकाई–II)

5. Define consumer' surplus. How is it measured ? 16

उपभोक्ता बेशी की परिभाषा दो। इसे कैसे मापा जाता है?

6. What is indifference curve ? Discuss its properties. 16

तटस्थता वक्र किसे कहते हैं? इसकी विशेषताएँ बताइए।

UNIT–III (इकाई–III)

7. Explain the law of variable proportion. 16

उत्पादन के परिवर्तनशील अनुपात के नियम का वर्णन कीजिए।

8. What is meant by elasticity of supply ? Explain the degrees of the elasticity of supply. 16

पूर्ति लोच से क्या अभिप्राय है? इसकी श्रेणियों का वर्णन कीजिए।

UNIT–IV (इकाई–IV)

9. Explain short run cost curves as per traditional theory of cost. 16

परम्परागत लागत सिद्धान्त के अनुसार अल्पकालीन लागतों का वर्णन कीजिए।

10. Explain the relationship among total revenue, average revenue and marginal revenue. 16

कुल, औसत और सीमान्त आगमों (Revenue) के बीच सम्बन्धों को बताइए।

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GSE/D-19 **728**

HEALTH AND PHYSICAL EDUCATION
(Theory)

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *one* question each from Unit I, II, III and IV. Unit V is compulsory for all.

नोट : इकाई I, II, III एवं IV प्रत्येक से **एक-एक** प्रश्न कीजिए। इकाई V सभी के लिए अनिवार्य है।

UNIT–I (इकाई–I)

1. Define physical education. Write down the objectives and scope of physical education. 10
शारीरिक शिक्षा को परिभाषित करें। शारीरिक शिक्षा के उद्देश्यों एवं क्षेत्र के बारे में समझाएं।

2. What do you mean by physical education ? Discuss the misconception prevailing in the society regarding physical education. 10
शारीरिक शिक्षा से आपका क्या तात्पर्य है? समाज में व्यापक शारीरिक शिक्षा से सम्बन्धित गलत धारणाओं पर चर्चा करें।

UNIT–II (इकाई–II)

3. Define health according to World Health Organisation. Explain the importance of health for an individual. 10
विश्व स्वास्थ्य संगठन के अनुसार स्वास्थ्य को परिभाषित करें। प्रत्येक व्यक्ति के लिए स्वास्थ्य के महत्त्व पर प्रकाश डालें।

4. Explain the term hygiene. How a person can keep the hygiene of various parts of the body ? 10
स्वच्छता शब्द की व्याख्या करें। व्यक्ति द्वारा अपने शरीर के विभिन्न अंगों की स्वच्छता रखने के तरीकों का वर्णन करें।

UNIT–III (इकाई–III)

5. Define yoga according to Maharishi Patanjali. Explain the importance of yoga in modern society. 10
महर्षि पतंजलि द्वारा दी गयी योग की परिभाषा लिखें। आधुनिक समाज में योग का महत्त्व दर्शाएं।

6. What do you mean by Pranayama ? Explain techniques, precautions and benefits of any *two* of the Pranayamas. 10
प्राणायाम किसे कहते हैं? किन्हीं **दो** प्राणायामों के करने की विधि, सावधानियां एवं लाभ के बारे में विस्तारपूर्वक लिखें।

UNIT–IV (इकाई–IV)

7. What do you mean by Anatomy and Physiology ? Explain its importance in the field of Physical Education. 10
शरीर रचना एवं शरीर क्रिया विज्ञान किसे कहते हैं? शारीरिक शिक्षा के क्षेत्र में इसके महत्त्व पर प्रकाश डालें।

8. Draw the diagram of a cell. Explain the structure of a human cell. 10
कोशिका का चित्र बनाएं एवं मानवीय कोशिका की संरचना के बारे में विस्तारपूर्वक लिखें।

UNIT–V (इकाई–V)

9. (a) What are the aims of Physical education ?
(b) Describe Adventurous sports.
(c) What is neuro-muscular co-ordination ?
(d) Physical factors effecting personal hygiene.
(e) Meaning of yoga.
(f) Explain system in human body.
(g) Smallest unit of human body.
(h) What are the three steps of Pranayama ?
(i) Explain personal hygiene.
(j) What is emotional development ? (2×10=20)

(क) शारीरिक शिक्षा के क्या लक्ष्य हैं?
(ख) साहसिक खेल क्या हैं?
(ग) नाड़ी-पेशीय तालमेल क्या है?
(घ) व्यक्तिगत स्वच्छता को प्रभावित करने वाले भौतिक कारक।
(ङ) योग शब्द का अर्थ।
(च) मानव शरीर में संस्थान क्या है?
(छ) मानव शरीर की सबसे छोटी इकाई क्या है?
(ज) प्राणायाम के तीन चरण कौन-से हैं?
(झ) व्यक्तिगत स्वच्छता की व्याख्या करें।
(ञ) भावनात्मक विकास किसे कहते हैं?

Roll No. .....

Total Pages : 3

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MUSIC VOCAL

MM-40

(Theory)

Paper–I

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *five* questions in all, selecting at least *one* question from each unit. Each question carries 8 marks.

नोट : प्रत्येक इकाई से कम से कम **एक** प्रश्न का चुनाव करते हुए, केवल **पाँच** प्रश्नों के उत्तर दीजिए। प्रत्येक प्रश्न के आठ अंक हैं।

UNIT–I (इकाई–I)

1. Write Notation of Vilambit Khyaal of Raag Alhiya Bilaval.

राग अल्हैया बिलावल की विलम्बित ख्याल की स्वरलिपि लिखिए।

2. Discuss about raag Bhupali with notation of Drut Bandish.

राग भूपाली के बारे में चर्चा करते हुए छोटे ख्याल की स्वरलिपि लिखिए।

3. Give the introduction of Raag Alhiya Bilaval in detail.

राग अल्हैया बिलावल का विस्तार से परिचय दें।

UNIT–II (इकाई–II)

4. Write the definition of following :

(a) Thaat.

(b) Raag.

(c) Taali.

(d) Khaali.

निम्नलिखित की परिभाषा लिखिए :

(क) थाट।

(ख) राग।

(ग) ताली।

(घ) खाली।

5. Write in detail about Saptak.

सप्तक के बारे में विस्तार से लिखें।

6. Discuss in detail about the history of Indian Music from Vedic period to 12th century in reference to Vocal Music.

गायन संगीत के विशेष संदर्भ में वैदिक काल से लेकर 12 वीं शताब्दी तक के संगीत के इतिहास पर विस्तार से चर्चा करें।

UNIT–III (इकाई–III)

7. Explain in detail about the difference between Shruti and Swar.

श्रुति और स्वर में क्या अन्तर है? विस्तार से समझाइए।

8. Discuss in detail about the contribution of Pt. Vishnu Digamber Paluskar in Indian Music.

भारतीय संगीत में पं. विष्णु दिगम्बर पलुस्कर के योगदान की विस्तार से चर्चा करें।

9. Write Ekgun of Char Taal and Teen Taal with detailed Introduction.

चार ताल और तीन ताल की एक गुन लिखते हुए विस्तार से परिचय दीजिए।

10. Give the definition of following :

(a) Aavartan.

(b) Sangeet.

(c) Shruti.

(d) Swar.

निम्नलिखित की परिभाषा दीजिए :

(क) आवर्तन।

(ख) संगीत।

(ग) श्रुति।

(घ) स्वर।

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GSE/D-19 **731**

MUSIC INSTRUMENTAL (SITAR)

Paper–I (Theory)

Time : Three Hours] [Maximum Marks : 40

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

नोट : प्रत्येक खण्ड में से कम से कम **एक** प्रश्न का चयन करते हुए, कुल **पाँच** प्रश्नों के उत्तर दीजिए। सभी प्रश्नों के अंक समान हैं।

SECTION–I (खण्ड–I)

1. Write down the notation of any Razakhani gat of your syllabus with *two* toras. 8
अपने पाठ्यक्रम में से किसी एक रज़ाखानी गत की स्वरलिपि **दो** तोड़ों सहित लिखिए।

2. Write the detailed description of Rag Alhaiya Bilawal. 8
राग 'अल्हैया बिलावल' का सम्पूर्ण परिचय लिखिए।

3. Write the notation of any Maseet khani gat of your syllabus with *two* toras. 8
अपने पाठ्यक्रम में से किसी एक मसीतखानी गत की स्वरलिपि **दो** तोड़ों सहित लिखिए।

4. Identify the following Ragas and give their short description.

(a) प मे ग रे, नि रे स।

(b) स रे ग रे, ग प ध प, ग रे स। (4+4=8)

निम्न रागों को पहचान कर उनका अल्प परिचय दीजिए:

(क) प मे ग रे, नि रे स।

(ख) स रे ग रे, ग प ध प, ग रे स।

SECTION–II (खण्ड–II)

5. Write short notes on any *two* of the following :

(a) Sangeet

(b) Swar

(c) Rag

(d) Saptak. (4+4=8)

निम्नलिखित में से किन्हीं **दो** पर टिप्पणी लिखिए:

(क) संगीत

(ख) स्वर

(ग) राग

(घ) सप्तक।

6. Explain the historical development of Indian music during Vedic Period. 8

वैदिक काल में हुए संगीत के ऐतिहासिक विकास की व्याख्या कीजिए।

7. Discuss in detail about the structure of sitar and its techniques. 8

सितार की बनावट तथा उसके बजाने की तकनीक पर विस्तार पूर्वक चर्चा कीजिए।

SECTION–III (खण्ड–III)

8. Describe the relationship between folk and classical music. 8

लोक संगीत तथा शास्त्रीय संगीत के आपसी सम्बन्ध का विस्तार पूर्वक वर्णन कीजिए।

9. Write down the contribution of Ustad Vilayat Khan in the field of music. 8

संगीत के क्षेत्र में उस्ताद विलायत खाँ का योगदान लिखिए।

10. Write the following Tolas in Ekgun and Dugun laykaries :

(a) Ektaal.

(b) Teentaal. (4+4=8)

निम्नलिखित तालों को एकगुण और दुगुण लयकारियों में लिखिए:

(क) एक ताल।

(ख) तीन ताल।

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GSE/D-19

742

OFFICE MANAGEMENT

Time : Three Hours]

[Maximum Marks : 80

Note : Attempt any *five* questions. All questions carry equal marks.

नोट : कोई **पाँच** प्रश्न करें। सभी प्रश्नों के अंक समान हैं।

1. What do you mean by 'office management' ? What are the functions of office management ? 16

'कार्यालय प्रबन्ध' से आप क्या समझते हैं? कार्यालय प्रबन्ध के कार्यों का वर्णन कीजिए।

2. "An office is to a business what the main spring is to a watch." Examine this statement and explain the significance of modern office. 16

"एक व्यवसाय में कार्यालय का वही स्थान है जो एक घड़ी में स्प्रिंग का" इस कथन की व्याख्या कीजिए एवं एक आधुनिक कार्यालय के महत्त्व की व्याख्या कीजिए।

3. Discuss the merits and demerits of decentralisation of office services. 16

कार्यालय सेवाओं के विकेन्द्रीयकरण के लाभ एवं हानियों पर प्रकाश डालिए।

4. Discuss the various methdos of departmentation of office activities. 16

कार्यालय के विभिन्न कार्यों के विभागीकरण की विधियों की चर्चा कीजिए।

5. What qualities should a successful office manager possess ? 16

एक सफल कार्यालय प्रबन्धक में किन गुणों का होना आवश्यक है?

6. Describe the factors affecting the choice of office accommodation. 16

कार्यालय स्थल के चुनाव को प्रभावित करने वाले तत्वों का वर्णन कीजिए।

7. Describe office layout. What are the benefits of good office layout ? Briefly describe the steps in office layout. 16

कार्यालय विन्यास की व्याख्या कीजिए। एक अच्छे कार्यालय विन्यास के लाभ बताइए। कार्यालय विन्यास के चरणों की संक्षिप्त व्याख्या कीजिए।

8. Discuss the impact of noise in relation to clerical work and the ways in which it can be reduced. 16

कार्यालयीन कार्यों पर शोर के प्रभाव एवं इसको कम करने के उपायों की चर्चा कीजिए।

9. What do you mean by the term 'office communication' ? Discuss various communication services used in a modern office. 16

कार्यालय संदेशवाहन शब्द से आप क्या समझते हैं? एक आधुनिक कार्यालय में प्रयोग होने वाली विभिन्न संचार सेवाओं की व्याख्या कीजिए।

10. Write a detailed note on correspondence through internet. 16

इंटरनेट द्वारा पत्राचार पर एक विस्तृत टिप्पणी लिखिए।

SECTION–IV

8. (a) Solve the equation $x^3 - 3x^2 + 12x + 16 = 0$ by Cardon's method. 3

(b) Solve the equation $40x^4 + 42x^3 + 3x^2 - 1 = 0$. 2½

9. (a) Solve the equation $x^4 - 4x^3 - 4x^2 - 24x + 15 = 0$ by Ferrari's method. 3

(b) Show that for all value of c, the equation $x^5 + 5x^2 + 3x + c = 0$ has at least two imaginary roots. 2½

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GSE/D-19 **751**

ALGEBRA

Paper : BM-111

Time : Three Hours] [Maximum Marks : 27

Note : Attempt *five* questions in all. Question No. 1 is compulsory. Select *one* question from each section.

Compulsory Question

1. (a) If A is non-singular matrix, then prove that det $(A^{-1}) = (\det A)^{-1}$. 1

(b) Give definition of row echelon matrix with example. 1

(c) Give definition of orthogonal matrix and unitary matrix with examples. 1

(d) Find an equation whose roots are the reciprocals of the roots of the equation $3x^5 - x^3 + 2x - 3 = 0$. 1

(e) Prove that every subset of a linearly independent subset is linearly independent. 1

SECTION–I

2. (a) Prove that every Hermitian matrix A can be expressed as $A = B + iC$, where B is real and symmetric and C is real and skew-symmetric. 3

(b) Express $A = \begin{bmatrix} 1 & 2 & -1 \\ 2 & 5 & -2 \\ 1 & 2 & 1 \end{bmatrix}$ as the product of elementary matrices. 2½

3. (a) Prove that every square matrix satisfies its characteristic equation. 3

(b) Obtain the minimal equation of the matrix $A = \begin{bmatrix} 2 & 3 & 4 \\ 0 & 2 & -1 \\ 0 & 0 & 1 \end{bmatrix}$, and show that it is non-derogatory. 2½

SECTION–II

4. (a) Solve

$$x + y + 2z + w = 5$$
$$2x + 3y - z - 2w = 2$$
$$4x + 5y + 3z = 7.$$ 3

(b) Show that the matrix

$$A = \begin{bmatrix} 0 & 2m & n \\ l & m & -n \\ l & -m & n \end{bmatrix}, \quad l = \frac{1}{\sqrt{2}}, \quad m = \frac{1}{\sqrt{6}}, \quad n = \frac{1}{\sqrt{3}}$$ is orthogonal. 2½

5. (a) Diagnolize the quadratic form

$$x^2 + 2y^2 - 7z^2 - 4xy + 8xz.$$

Also find rank, index, signature and equations of transformation. 3

(b) Determine the definiteness of the quadratic form

$$-x^2 - 2y^2 - 2z^2 + 2xy + 2yz$$

using Sylvester's criterion. 2½

SECTION–III

6. (a) Find the remainder in the division of $x^3 + 3px + q$ by $(x - a)^2$ and deduce that $x^3 + 3px + q = 0$ has two equal roots if $q^2 + 4p^3 = 0$. 3

(b) Solve the equation $x^4 + 15x^3 + 70x^2 + 120x + 64 = 0$, whose roots are given to be in G.P. 2½

7. (a) Find the roots of the equation

$$15x^4 - 8x^3 - 14x^2 + 8x - 1 = 0$$

given that the roots are in H.P. 3

(b) If α, β, γ are the roots of the equation $x^3 - 6x^2 + 11x + k = 0$, find an equation whose roots are $\alpha - 2\beta + \gamma$, $\beta - 2\gamma + \alpha$, $\gamma - 2\alpha + \beta$. Also find the value of k if roots of given equation are in A.P. 2½

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GSE/D-19 **753**

MATHEMATICS
(Solid Geometry)
Paper : BM-113

Time : Three Hours] [Maximum Marks : 27

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory.

Compulsory Question

1. (a) Discuss the nature of conic $x^2 - 2xy + 2y^2 - 4x - 6y + 3 = 0$. 2

(b) Define conjugate diameters. 1

(c) Under what condition cone $ax^2 + by^2 + cz^2 + 2fyz + 2gzx + 2hxy = 0$ have three mutually perpendicular generators. 2

(d) Show that the two spheres
$x^2 + y^2 + z^2 + 6y + 2z + 8 = 0$
$x^2 + y^2 + z^2 + 6x + 8y + 4z + 20 = 0$ are orthogonal. 2

SECTION–I

2. (a) Find the length of the axes, the eccentricity and the equations of the axes of the conic
$5x^2 + 6xy + 5y^2 + 4x + 12y - 4 = 0$. 2½

(b) Trace the conic $x^2 + xy + y^2 + x - 4y + 1 = 0$. 2½

3. (a) To find the polar equation of director circle. 2½

(b) Prove that the conic $x^2 + 2y^2 - 1 = 0$ and $3x^2 + 8xy + 10y^2 - 4x - 8y + 1 = 0$, have double contact with each other. 2½

SECTION–II

4. (a) Obtain the equation of the sphere, having the circle $x^2 + y^2 + z^2 + 10y - 4z - 8 = 0$, $x + y + z = 3$ as the great circle. 2½

(b) If through a given point P, is drawn any chord Q, R to sphere $x^2 + y^2 + z^2 + 2ux + 2vy + 2wz + d = 0$. Then prove that PQ. PR is a constant. 2½

5. (a) To find the condition that $F(x, y, z) = ax^2 + by^2 + cz^2 + 2fyz + 2gzx + 2hxy + 2ux + 2vy + 2wz + d = 0$ may represents a cone. 2½

(b) Find the equation of the enveloping cylinder of the sphere $x^2 + y^2 + z^2 = 25$ having its generator parallel to the line $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$. 2½

SECTION–III

6. (a) To prove that six normals can be drawn from a point (a, b, c) to the ellipsoid $\frac{x^2}{\alpha^2} + \frac{y^2}{\beta^2} + \frac{z^2}{\gamma^2} = 1$. 2½

(b) To find the equation of the polar plane of (a, b, c) w.r.t. the ellipsoid $\frac{x^2}{\alpha^2} + \frac{y^2}{\beta^2} + \frac{z^2}{\gamma^2} = 1$. 2½

7. (a) Find the equation of the enveloping cone (tangent cone) from the point (x_1, y_1, z_1) to the conicoid $ax^2 + by^2 + cz^2 = 1$. 2½

(b) Find the centre of conic given by the equations $2x - 2y - 5z + 5 = 0$, $3x^2 + 2y^2 - 15z^2 = 4$. 2½

SECTION–IV

8. (a) Reduce the following equation to the standard form

$4x^2 + 9y^2 + 36z^2 - 36yz + 24zx - 12xy - 10x + 15y - 30z + 6 = 0$. 2½

(b) Find the equations to the generating lines of the hyperboloid $\frac{x^2}{4} + \frac{y^2}{9} - \frac{z^2}{16} = 1$ which pass through the point (2, –1, 4/3). 2½

9. Prove that the surface whose equation is $16x^2 + 4y^2 + 4z^2 + 4yz - 8zx + 8xy + 4x + 4y - 16z - 24 = 0$ is an elliptic paraboloid. Find the co-ordinates of its vertex and the equation to its axis. 5

9. (a) Solve $x^4 + 2x^3 - 7x^2 - 8x + 12 = 0$ by Ferrari's method. 4

(b) Show that the equation $x^7 + x^4 + 8x + k = 0$ has at least four imaginary roots for all values of k. 4

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GSE/D-19 **782**

ALGEBRA

Paper : BM–III

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all. Question No. 1 is compulsory. Select *one* question from each section.

Compulsory Question

1. (a) Prove that every orthogonal matrix is non-singular. 1½

(b) Prove that the set of vectors (1, 2, 0), (0, 3, 1) and (–1, 0, 1) is linearly independent. 1½

(c) Prove that the quadratic form $q = x_1^2 + x_2^2 + x_3^2$ is positive definite. 2

(d) Show that every identity matrix of order $n \geq 2$ is derogatory. 1½

(e) If α, β, γ are roots of equation $x^3 + px^2 + qx + r = 0$ then find $\sum \frac{1}{\alpha}$. 1½

SECTION–I

2. (a) Prove that every square matrix A can be expressed in one and only one way as P + iQ, where P and Q are Hermitian matrices. 4

(b) For the matrix A, find non-singular matrices P and Q such that PAQ is in normal form $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & -1 & -1 \\ 3 & 1 & 1 \end{bmatrix}$; hence find the rank of A. 4

3. (a) Prove that the characteristic roots of a real symmetric matrix are all real. 4

(b) Prove that $A = \begin{bmatrix} 2 & 6 & 1 \\ 0 & 1 & -6 \\ 3 & 4 & 2 \end{bmatrix}$ satisfies its characteristic equation. Also find its inverse, if it exists. 4

SECTION–II

4. (a) Check whether the following system of equations is consistent or not. Solve if it is consistent.

$4x + 3y + 2z = -7;$

$2x + y - 4z = -1;$

$x + 2y + z = 1.$ 4

(b) Prove that the absolute value of each characteristic root of unitary matrix is unity. 4

5. (a) For what value of λ, the equations

$x + y + z = 1$

$x + 2y + 4z = \lambda$

$x + 4y + 10z = \lambda^2$

have a solution and solve them completely in each case. 4

(b) Diagonalize the quadratic form

$$x_1^2 + 2x_3^2 - 7x_3^2 - 4x_1x_2 + 8x_1x_3.$$

Also, find the rank, index, signature and equations of transformation. 4

SECTION–III

6. (a) Find the remainder in the division of $x^3 + 3px + q$ by $(x - a)^2$, and deduce that it has two equal roots if $q^2 + 4p^3 = 0$. 4

(b) If b and c are real and $2 - \sqrt{-3}$ is a root of the equation $x^3 + x^2 + bx + c = 0$, what are the other roots and what is the value of c ? 4

7. (a) Find the condition that the sum of two roots of the equation $x^4 + px^3 + qx^2 + rx + s = 0$ is equal to zero. 4

(b) If α, β, γ are the roots of the cubic $x^3 + 3x + 2 = 0$, find the equation whose roots are $(\alpha - \beta)(\alpha - \gamma)$, $(\beta - \gamma)(\beta - \alpha)$, $(\gamma - \alpha)(\gamma - \beta)$. Hence show that the given cubic has two imaginary roots. 4

SECTION–IV

8. (a) Solve the equation $28x^3 - 90x^2 + 1 = 0$ by Cardan's method. 4

(b) Apply Descarte's method to solve the equation $x^4 - 3x^2 - 42x - 40 = 0$. 4

(b) Show that the volume of the solid formed by the revolution of the curve $r = a + b \cos \theta$ $(a > b)$ about the initial line is $\frac{4}{3}\pi a (a^2 + b^2)$. 4

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GSE/D-19 **783**

MATHEMATICS

(Calculus)

Paper : BM-112

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is compulsory.

Compulsory Question

1. (a) Evaluate $\lim_{x \to 0} \frac{7|x|}{x^2 + 2x}$. 1

(b) Derive reduction formula for $\int \tan^n x \, dx$. 2

(c) Find the area of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$. 2

(d) Find the radius of curvature of the curve $y = e^x$ at the point where it crosses the y axis. 2

(e) Define point of inflexion. 1

SECTION–I

2. (a) Using $\varepsilon - \delta$ definition, prove that $\cos^2 x$ is a continuous function. 4

(b) If $y = \sin(m \sin^{-1} x)$, prove that

(i) $(1 - x^2)y_2 - xy_1 + m^2 y = 0$

(ii) $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} + (m^2 - n^2)y_n = 0$. 4

3. (a) Expand $\cos x$ in powers of x and hence find $\cos 18^\circ$ upto four decimal places. 4

(b) If $f(x) = x^3 - 2x + 5$ find value of $f(2.001)$ with the help of Taylor's theorem. Find the change in the value of $f(x)$ from $f(2.00)$ to $f(2.001)$. 4

SECTION–II

4. (a) Find all the asymptotes of the curve $(x + y)^2(x + y + z) - x - 9y + z = 0$. 4

(b) Find the asymptotes of the curve $r \cos\theta = a \sin^2\theta$. 4

5. (a) Find the radius of curvature for the curve $r^n = a^n \cos n\theta$. 4

(b) Show that the curve $x^5 - 2x^3y - 4x^2y + 8y^2 = 0$ has a point of oscul inflexion at the origin. 4

SECTION–III

6. (a) Evaluate $\int_0^{\pi/2} \sin^n x\,dx$ where n is positive even and odd integer. 4

(b) Prove that $\int_0^{\pi/2} \sin^{2n} x\,dx = \frac{2n!}{[2^n n!]^2}\frac{\pi}{2}$. 4

7. (a) Find the length of the arc $x^2 + y^2 - 2ax = 0$ in the first quadrant. 4

(b) Find the intrinsic equation of the cycloid $x = a(t + \sin t)$, $y = a(1 - \cos t)$ and prove $s^2 + \rho^2 = 16a^2$. 4

SECTION–IV

8. (a) Find the area common to the circle $x^2 + y^2 = 4$ and the ellipse $x^2 + 4y^2 = 9$. 4

(b) Show that the area of the region included between the cardioids $r = a(1 + \cos\theta)$ and $r = a(1 - \cos\theta)$ is $\frac{a^2}{2}(3\pi - 8)$. 4

9. (a) The circle $x^2 + y^2 = a^2$ is revolved about the x axis. Find the volume of the sphere so formed. 4

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GSE/D-19

MATHEMATICS
(Solid Geometry)
Paper : BM-113

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from each section. Quetion No. 1s is compulsory.

Compulsory Question

1. (a) Find the equation of the polar line $\frac{x+1}{2} = \frac{y-2}{3} = z+3$ w.r.t. the sphere $x^2 + y^2 + z^2 = 1$. 2

(b) Find the point of intersection in which the line $\frac{x+2}{4} = \frac{y+9}{3} = \frac{z-8}{-5}$ meets the sphere $x^2 + y^2 + z^2 = 49$. 2

(c) Find the equation of the tangent to the conic $x^2 - 3xy + y^2 + 10x - 10y + 21 = 0$ at (0, 1). 2

(d) Find the nature of the conic $5x^2 + 6xy + 5y^2 + 4x + 12y - 4 = 0$. 2

SECTION–I

2. Find the center, length and equations of axes, eccentricity, foci of the conic $8x^2 - 4xy + 5y^2 - 16x - 14y + 17 = 0$. Also trace this conic.

3. (a) Show that the equation $9x^2 + 24xy + 16y^2 - 2x + 14y + 1 = 0$ represents a parabola. Also find its focus, vertex, axis and latus rectum. 4

(b) Find the equation of the director circle of the conic $14x^2 - 4xy + 11y^2 - 44x - 58y + 71 = 0$. 4

SECTION–II

4. (a) Find the equation of the sphere through the circle $x^2 + y^2 + z^2 + 2x + 3y + 6 = 0$; $x - 2y + 4z - 9 = 0$ and passing through the center of the sphere $x^2 + y^2 + z^2 - 2x + 4y - 6z + 5 = 0$. 4

(b) Show that $2x - y - 2z = 4$ is a tangent plane to the sphere $x^2 + y^2 + z^2 + 2x - 6y + 1 = 0$. Also find the point of contact.

5. (a) Find the equation of the right circular cone whose vertex is (0, 0, 0) and which passes through. (1, 1, 2) and has axis $\frac{x}{2} = \frac{y}{-4} = \frac{z}{3}$. 4

(b) Find the equation of the right circular cylinder of radius 2 whose axis is the line $\frac{x-1}{2} = \frac{y-2}{1} = \frac{z-3}{2}$. 4

SECTION–III

6. (a) To prove that six normals can be drawn from a point (a, b, c) to the ellipsoid $\frac{x^2}{\alpha^2} + \frac{y^2}{\beta^2} + \frac{z^2}{\gamma^2} = 1$. 4

(b) Find the center of the conic given by the equations $2x - 2y - 5z + 5 = 0$ and $3x^2 + 2y^2 - 15z^2 = 4$. 4

7. (a) Find equation of the pólar of the line $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ w.r.t. the conicoid $x^2 - 2y^2 + 3z^2 = 4$ in the symmetrical form.

(b) Find equation of the enveloping cylinder of the conicoid $2x^2 + y^2 + 3z^2 = 1$ whose generators are parallel to the line $\frac{x}{1} = \frac{y}{2} = \frac{z}{2}$. 4

SECTION–IV

8. Show that the surface whose equation is $16x^2 + 4y^2 + 4z^2 + 4yz - 8zx + 8xy + 4x + 4y - 16z - 24 = 0$ is an elliptic paraboloid. Find the co-ordinates of its vertex and the equation of its axis. 8

9. (a) Show that the plane $8x - 6y - z = 5$ touches the paraboloid $3x^2 - 2y^2 = 6z$ and find the point of contact. 4

(b) Find the equations of generating lines of the hyperboloid $yz + 2zx + 3xy + 6 = 0$ which passes through the point $(-1, 0, 3)$. 4

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GSE/D-19

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PHYSICS

Classical Mechanics and Theory of Relativity

Paper–I

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *five* questions. Question No. 1 is compulsory. Attempt *four* more questions selecting *one* question from each unit. The symbol have their usual meaning.

Compulsory Question

1. (a) What is a conservative force ? Give an example of a conservative force. 2

(b) Define configuration space. What is its importance. 2

(c) What do you understand by inertial and non-inertial frame of reference ? 2

(d) Whether mass of a particle is a constant quantity, if not then explain how it varies. 2

UNIT–I

2. (a) State and prove law of conservation of energy of a single particle. 6

(b) Explain in brief the importance of center of mass. 2

3. What is angular momentum ? State and prove law of conservation of angular momentum of a system of N particles. 8

UNIT–II

4. (a) Define Hamilton's principle and derive Lagrange's equation from Hamilton's Principle. 6

   (b) Differentiate between degrees of freedom and generalised coordinates with examples. 2

5. What is an Atwood machine ? Derive the expression for its acceleration using lagrangian formalism. What will be the value of expression, when the ratio of its masses become 2 : 1. 8

UNIT–III

6. (a) What are Galilean transformations ? Prove that law of conservation of Kinetic energy in invariant under these transformations. 6

   (b) What is a coriolis force ? Write its two consequences. 2

7. Describe Michelson and Morley Experiment. Give a brief explanation of the result. 8

UNIT–IV

8. (a) What are Lorentz-transformations ? Explain Length contraction using these transformations. 6

   (b) At what speed a clock should be travelling so that it may appears to loose 2 minutes in 1 hour. 2

9. What are the postulates of special theory of relativity ? Derive the expression for the relativistic mass of a particle.

$$m = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}.$$

(ii) capacitive reactance (X_C) of capacitor and (iii) impedance (Z) of the circuit with frequency. Find resonant frequency of this circuit. 5

(b) What is meaning of sharpness of a series resonant circuit ? How is it related with bandwidth of the circuit ? 3

Roll No. .....513..... Total Pages : 4

GSE/D-19 **790**

PHYSICS

(Electricity, Magnetism and Electromagnetic Theory)

Paper–II

Time : Three Hours] [Maximum Marks : 40

Note : (i) Question No. 1 is compulsory.

(ii) Attempt *four* more questions, selecting *one* question from each unit.

(iii) Attempt all parts of Question No. 1 at one place only.

(iv) Use of scientific (non-programmable) calculator is allowed.

Compulsory Question

1. (a) Distinguish between solenoidal and irrotational vector fields. 2

(b) What is effect of temperature on magnetic susceptibility of a diamagnetic material ? 2

(c) How is displacement current different from conduction current ? 2

(d) The r.m.s. value of alternating voltage in mains is 220 V. Calculate its peak value. 2

UNIT–I

2. (a) Show that divergence of curl of a vector is always zero. 3

(b) State and prove Gauss divergence theorem. How is it different from Stoke's theorem ? 5

3. (a) Discuss the physical significance of gradient of a scalar function. 3

(b) Derive relation for curl of a vector in Cartesion co-ordinates. 5

UNIT–II

4. (a) Prove that for magnetic induction $\vec{B}$: (i) $\vec{\nabla}.\vec{B} = 0$ and (ii) $\vec{\nabla} \times \vec{B} = \mu_0 \vec{J}$ where letters have their usual meanings. 4

(b) Discuss Languins electron theory for diamagnetic materials and derive relation for magnetic susceptibility of such a material. 4

5. (a) Show that energy loss per unit volume per cycle of magnetization is equal to area of B–H curve of ferromagnetic material. 4

(b) Why steel is a better choice than soft iron for making permanent magnets ? 2

(c) The magnetic susceptibility χ_m of Al is 2.3×10^{-5}. Calculate its absolute and relative permeability. 2

UNIT–III

6. (a) Write *four* Maxwell's equations for electromagnetic fields and discuss the significance of each equation. 4

(b) What is magnetic scalar potential ? Derive relation for it. 4

7. (a) Derive boundary conditions for $\vec{B}$ and $\vec{E}$ at interface between two media. 6

(b) What are electromagnetic waves ? Write their general properties. 3

UNIT–IV

8. (a) Derive phase relation between alternating e.m.f. and a.c. in a circuit containing an inductor and a resistance in series using j-operator. What is impedance of this circuit ? 5

(b) An alternating e.m.f. of 20 V, 50 Hz is applied to a circuit containing an inductance of 100 mH and a resistance of 20 ohm connected in series. Find the a.c. in the circuit. 3

9. (a) Consider a circuit in which an inductor 'L', a capacitor 'C' and a resistance 'R' are connected in series with a source of alternating e.m.f. Discuss graphically the variation of (i) inductive reactance (X_L) of inductor,

Roll No. .....

Total Pages : 3

GSE/D-19

791

CHEMISTRY

(Inorganic Chemistry)

Paper : CH-101

Time : Three Hours]

[Maximum Marks : 32

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

Compulsory Question

1. (a) Why dipole moment of CCl_4 is zero ?

(b) How many degenerate orbitals are present in 3d subshell ?

(c) Why size of anion is bigger than neutral atom ?

(d) Which lattice defect decreases density of lonic crystal ?

(e) Define Polarisability.

(f) Why Li_2CO_3 is unstable while Na_2CO_3 is quite stable ?

(g) Name the type of hybridisation of central atom in NO_3^{-1} ion.

(h) When a subshell is labelled as 's' the value of l is ..... and m has value ..... (1×8)

SECTION–A

2. (a) Write electronic configuration of Na^{+1} and Lanthanum (z = 57). 2

(b) Draw shapes of 1s and 2s orbitals. What is basic difference between their structures ? 2

(c) What are Normal and Orthogonal wave functions ? 2

3. (a) Calculate deBroglie wavelength of an electron having kinetic energy 4.55×10^{-25} J. Given h = 6.6×10^{-34} Kg m^2 s^{-1} $m = 9.1 \times 10^{-31}$ Kg. 2

(b) Calculate effective nuclear charge experienced by 3d electron of Iron (z = 26). 2

(c) What is significance of Uncertainty principle in our daily life ? 2

4. (a) Discuss various factors on which Ionisation energy depends. 2½

(b) Why first ionisation energy of Aluminium is lower than magnesium ? 2

(c) Write general electronic configuration of d-Block and f-Block elements. 1½

5. (a) Discuss Mulliken scale of electronegativity and give its disadvantages. 2½

(b) Why ionisation energy of Na^{+1} is more than that of Neon ? 2

(c) Why Electron affinity of Be and Mg are zero ? 1½

SECTION–B

6. (a) Discuss the shape of ClO_4^{-1} on the basis of hybridization. 2

(b) Sketch the shapes of molecular orbitals obtained by sidewise p-p overlapping of atomic orbitals. 2

(c) Write various factors on which Bond energy depends. 2

7. (a) Draw molecular orbital energy level diagram for Nitric oxide (NO) molecule and calculate its bond order. 2

(b) What are main postulates of molecular orbital theory ? 2

(c) Dipole moment of H–X molecule is 1.92 D and bond distance is 1.2 Å. Calculate percentage of ionic character of H–X. 2

8. (a) Draw and discuss structure of Sodium chloride. 2½

(b) What are Frenkel defects ? 2

(c) Why molten NaCl can conduct electricity ? 1½

9. (a) Write down the factors favouring the formation of ionic bond. 2

(b) Tabulate Radius ratio rule for ionic crystals. 2

(c) Why silver halides are insoluble in water ? 2

Roll No. .....

Total Pages : 3

GSE/D-19

793

CHEMISTRY
(Physical Chemistry)
Paper–II

Time : Three Hours]

[Maximum Marks : 32

Note : Attempt *five* questions in all. Question No. 1 is compulsory. Select *two* questions from each section.

Compulsory Question

1. (a) At what temperature the root mean square velocity of chlorine gas will be equal to that of SO_2 at NTP ? 2

(b) Distinguish between an ideal gas and a real gas. Explain graphically in terms of compressibility factor how real gases show deviation from ideal behaviour. 3

(c) Briefly explain the law of constancy of interfacial angles. 2

(d) What is Boyle's temperature ? 1

SECTION–A

2. (a) The reduced volume and reduced temperature of a gas are 10.2 and 0.7 respectively. What will be its pressure if its critical pressure is 42 atmospheres ? 2½

(b) Define the terms (i) Mean free path, (ii) Collision number, and (iii) Collision frequency. Discuss the effect of temperature and pressure on collision frequency. 3½

3. (a) Using Van der Waal's equation, derive the reduced equation of state. Also state the "Law of corresponding states". 3

(b) Calculate mean free path of oxygen molecules at 0°C and one atmospheric pressure, given that the molecular diameter of oxygen molecule is 2×10^{-8} cm. 3

4. (a) Explain diagrammatically how the molecular velocities change with increase of temperature. 1½

(b) Define the terms (i) Critical temperature, (ii) Critical pressure, and (iii) Critical volume. Derive expressions for critical constants in terms of Van der Waal's constants. 4½

5. (a) Describe Andrew's experiment on critical phenomenon. 3½

(b) Briefly explain the terms (i) Root mean square velocity, (ii) Average velocity, and (iii) Most probable velocity. 2½

SECTION–B

6. (a) At what angle will X-rays of wavelength 1.542×10^{-10} m undergo second order reflection by planes separated by 3.5×10^{-10} m ? 2

(b) Define Surface tension. Describe any *one* method for the determination of surface tension of a liquid. 3

(c) Why cooling is caused by evaporation ? 1

7. (a) The value of $[\alpha]_D^{20}$ for lactose is 55.4°. What is the concentration in grams per litre of a solution of lactose which gives a rotation of 7.24° in a 10 cm cell at 20°C with sodium D light ? 2

(b) Both NaCl and KCl have similar structures, yet their X-ray diffraction patterns are remarkably different. Why ? 2

(c) What are the factors on which optical rotation depends ? Derive an expression for specific rotation. 2

8. (a) Describe Ostwald's method for determination of viscosity of the liquid. 2

(b) What are elements of symmetry in crystallography ? Describe each of them. 4

9. (a) Calculate the molar refraction of acetic acid at temperature at which its density is 1.046 cm^{-3}. The experimentally observed value of respective index at this temperature is 1.3715. 2

(b) Derive Bragg's equation for the diffraction of X-rays by crystals. 3

(c) What is Dunstan's rule ? Explain with an example. 1

7. (a) What are electrophiles ? Give their types with examples. 3

(b) Explain the following with suitable examples :

(i) Substitution reactions.

(ii) Elimination reactions.

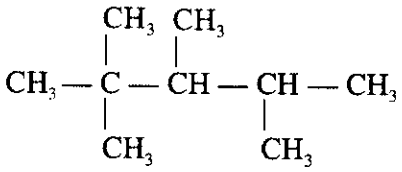
(iii) Addition reactions. 3

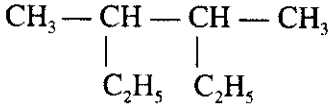
8. (a) Give preparation of alkanes by :

(i) Kolbe's reaction.

(ii) Carey House Reaction. 4

(b) Give IUPAC names of the following :

(i) 

(ii)  2

9. (a) Define and explain reactivity– selecting principle. 3

(b) Give *two* methods of preparation of cycloalkanes. 3

Roll No. ..... Total Pages : 4

GSE/D-19 **795**

CHEMISTRY

[Organic Chemistry (Theory)]

Paper : III

Time : Three Hours] [Maximum Marks : 32

Note : Attempt *five* questions in all, by selecting *two* questions from each section. Question No. 1 is compulsory.

Compulsory Question

1. (a) Which is permanent effect :

(i) Inductive effect.

(ii) Electromeric effect.

(b) Why all carbon-carbon bonds are equivalent in benzene ?

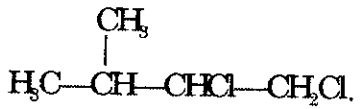
(c) Write the structure of optically active carboxylic acid having molecular formula $C_3H_6O_3$.

(d) Out of eclipsed and staggered conformation of ethane, which is more stable.

(e) Give the type of hybridisation and structure of alkyl carbanion.

(f) Give an example of plane of symmetry.

(g) Mark the secondary carbon atom in the following :



(h) Pick up electrophiles from the following :

ROH, H_3O^+, BF_3, CN^- (1×8=8)

SECTION-A

2. (a) Define resonance. Write the properties of resonance hybrid. 2

(b) What are localised and delocalised bonds ? Give examples. 2

(c) What is inductive effect ? Discuss the types citing suitable examples. 2

3. (a) Define electromeric effect. What is the main condition for this effect to occur ? 2

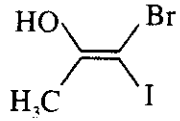
(b) What are functional isomers ? Give two examples. 2

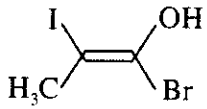
(c) What is hyperconjugation ? Why is it called no-bond resonance ? 2

4. (a) Explain the cause of optical activity. 2

(b) What are the axial and equitorial bonds in cyclohexane? 2

(c) Assign E and Z configuration

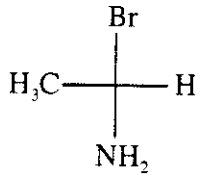
(i) 

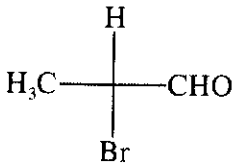
(ii) 

5. (a) Differentiate between configuration and conformation. 2

(b) What are meso compounds ? Give examples. Why are they optically inactive ? 2

(c) Assign R and S configuration.

(i) 

(ii)  2

SECTION-B

6. (a) What are free radicals ? Explain the order of stability of free radicals. 3

(b) What are carbenes ? Give their types and draw their structures. 3

Roll No. 12003408 6 Total Pages : 7

GSE/D-19 **797**

ENGLISH

Time : Three Hours] [Maximum Marks : 40

Note : All the questions are compulsory.

1. Read the passage and answer the questions that follow :

An old mad, blind despised, and dying king,-
Princes, the dregs of their dull race, who flow
Through public scorn, –mud from muddy spring–,
Rulers who neither see, nor feel, nor know,
But leech–like to their fainting country cling.

(a) Name the poem and the poet.
(b) What do you understand by dull race?
(c) Why the rulers are being compared to leeches?
(d) Explain the expression "dull race".
(e) Why the king is despised?

OR

Happy those early days, when I
Shine in my Angel-infancy !
Before I understood this place
Appointed for second race,
Or taught my soul to fancy aught
But a white celestial thought

(a) Name the poem and the poet.

(b) What do you understand by "Early days"?

(c) What does poet mean by "this place"?

(d) What is "second race"?

(e) What do you understand by "celestial thought"? (5)

2. Explain with reference to the context :

All human things are subject to decay,
And when Fate summons, Monarchs must obey.
This flecknoe found, who, like Augustus, young
Was called to empire, and had governed long;

OR

He hangs between; in doubt his mind or body to prefer;
Born but to die, and reasoning but to err;
Alike in ignorance, his reason such,
Whether he thinks too little or too much. (3)

3. Answer the following questions in about 30 words :

(a) Why does poet compares true love to pole star?

OR

How does Milton regret the loss of his 'light'?

(b) Who was Shadwell?

OR

Give an example of paradox used by Pope in the poem "Know then Thyself".

(c) Where was little black boy born?

OR

Comment on the expression "mute insensate things".

(d) Explain the following expression "Golden and sanguine laws".

OR

What kind of farewell does Tennyson wish for?

(1½×4=6)

4. Develop Wordsworth's philosophy of nature.

OR

What according to Shakespeare are the characteristics of true love? (6)

5. Translate the following passage into English :

हमारा शरीर एक मशीन के समान है। यदि किसी मशीन के पुरजे में दोष पड़ जाए तो वह ठीक कार्य नहीं करती। ठीक यह अवस्था हमारे शरीर की है। यदि हमारे शरीर के किसी अंग

में दोष पड़ जाए तो हमारी निरोगता बिगड़ जाती है, हम बीमार पड़ जाते हैं। बीमार शरीर वाला मनुष्य जीवन का आनन्द नहीं ले सकता, न ही वह अच्छा नागरिक सिद्ध हो सकता है। इसलिए कहते हैं कि निरोग शरीर में ही निरोग मन का निवास होता है। (4)

(For Non-Hindi speaking students in lieu of translation)

Read the passage and answer the questions that follow :

Trees prevent the surface soil of the earth from being washed away by shower. Our earth has a covering of fine soil on the surface, and under the soil lie rocks of various kinds. The surface soil supports the life plants, which in turn, supply the food that animals need. Nature takes millions of years to form soil an inch thick. But a single heavy shower sometimes, washes off a good part of the surface soil on a bare hillside. This will not happen in places where there are plenty of trees. Since the trees stop the fair flow of water and their roots hold the soil together, they prevent the soil from being washed away. The soil in forests absorbs water very easily and in this way trees also help to prevent sudden floods.

Questions :

(a) What do trees prevent?

(b) What is there under the soil of the earth?

(c) How much time does nature take to form an inch of soil?

(d) What does the surface soil do?

OR

Everyone felt that his end was near. He had grown pale and frail, but he continued to work hard. His wife was in tears to see him burning his candle of life at both ends. Then came the news that Maxim Gorky, the great Russian writer, was dead. A meeting was called to moan his death and Prem Chand weak and ailing as he was insisted that he would attend it. His wife thought him crazy. After all, who was Gorky to them? He was not even an Indian writer. But to Prem Chand, Gorky was dearer than his own life. He was like him a writer who had given blood and tears to his writings. He was, like Prem Chand, a writer of the poor people. So this frail man walked from his sick bed to pay homage to Gorky.

Questions :

(a) Why was Prem Chand's wife stricken with grief?

(b) Why did Prem Chand go to attend the meeting held to mourn the death of Gorky?

(c) Why did Prem Chand like Gorky?

(d) What did everyone feel?

6. Write a paragraph on any *one* of the given topics :

(a) Morning Walk.

(b) Terrorism.

(c) Reading Newspaper.

(d) My Ideal.

(e) Corruption. (6)

7. Do as directed :

(a) Use these phrasal verbs in sentences of your own :

(i) Take after

(ii) Wipe out

(iii) Make-up.

(b) Fill in the blank with correct prepositions :

(i) I will meet him ..... night.

(ii) He is afraid ..... going there.

(iii) You are devoid ..... Common sense.

(c) Correct any *four* of the following sentences :

(i) What are the news?

(ii) The sister of Ram is very good at cooking.

(iii) No one in their senses can do it.

(iv) Mohan and Sohan help one another.

(v) Neither of his parents are Indian.

(vi) He is a coward man. (10)

Roll No. ..... Total Pages : 2

GSE/D-19 **800**

BOTANY

(Diversity of Microbes)

Paper : I

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *two* questions from each unit. Question number 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. Define the following :

(a) Anisogamy.

(b) Coenobium.

(c) Heterothallism.

(d) Prokaryote.

(e) Saprophytes.

(f) Soredia.

(g) Symbiosis.

(h) Transformation. (1×8=8)

UNIT–I

2. Describe the structure of a typical bacterial cell. 8

3. Give a brief description of the following :

(a) Sexual reproduction in *Volvox.*

(b) Asexual reproduction in *Vaucheria.* (4+4)

4. Describe the structure and life cycle of *Polysiphonia.* 8

5. Describe the economic importance of Algae. 8

UNIT–II

6. Write short notes on the following :

(a) Bacteriophage.

(b) Transmission of Plant viruses. (4+4)

7. Give a concise account of any *two* of the following :

(a) Sexual reproduction in *Phytophthora.*

(b) Asexual reproduction in *Mucor.*

(c) Sexual reproduction in *Penicillium.* (4+4)

8. Write short notes on the following :

(a) Economic importance of Lichens.

(b) Acervulus. (4+4)

9. Describe the life cycle of *Puccinia.* 8

Roll No. .....

Total Pages : 2

GSE/D-19

801

BOTANY

(Cell Biology)

Paper : II

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *two* questions from each unit. Question No. 1 is compulsory and short answer type. All questions carry equal marks. Draw neat and well labelled diagrams where they are necessary.

Compulsory Question

1. (a) Define Oxysomes.

(b) What is Granum.

(c) What is Telomere ?

(d) What are Allosomes ?

(e) What is micelle ?

(f) Define Nuclear-pore complex.

(g) Write the significance of Meiosis.

(h) What is cri-du-cat syndrom in a child ? (1×8=8)

UNIT–I

2. Describe the Ultra-Structure and function of Endoplasmic Reticulum. 8

3. Write short notes on the following :

(a) Lysosomes.

(b) Structures and Chemical nature of cell wall. (4, 4)

4. Explain in detail Ultra-structure of chloroplast. 8

5. Explain the following briefly :

(a) Golgi Bodies.

(b) Peroxisomes and Vacuoles. 4,4

UNIT–II

6. Compare prophase stage of Mitosis and Meiosis. 8

7. Explain the following briefly :

(a) Inversion.

(b) Autotetraploidy. (4, 4)

8. Describe the structure of Chromosome in detail. 8

9. Write short note on the following :

(a) XX-XY type Sex Determination.

(b) Polyploidy. (4,4)

Roll No. .....

Total Pages : 3

GSE/D-19

803

ZOOLOGY

(Life and Diversity of Coelentrata to Helminthes and Cell Biology–II)

Paper–II

Time : Three Hours]

[Maximum Marks : 40

Note : Attempt *five* questions in all. Q. No. 1 is compulsory. Select *two* questions from each Section A and B. Draw well labelled diagrams wherever they are necessary.

Compulsory Question

1. Answer the following question in not more than 20 words :

(a) Define metagenesis.

(b) Why is the gastrula of *Olelia* (*OBELIA*) is called sterogastrula?

(c) What is an atoll?

(d) Name all the larval forms of *Fasciola.*

(e) What is NOR?

(f) What is Warburg effect?

(g) Name the organs of primary lymphatic system.

(h) What are idiograms?

(i) Why human RBC have a very short lifespan?

(j) Explain telophase. (1×10=10)

SECTION–A

2. (a) Give an account of histology of polyp of *Obelia.* 4

(b) Differentiate between a polyp and medusa of *Obelia.* 3½

3. (a) Define the phenomenon of polymorphism in coelenerata. 4½

(b) Discuss the general characters of Phylum Platyhelminthes. 3

4. (a) Describe various larval stages found in the life history of a liver fluke. 5

(b) Discuss parasitic adaptations in *Fasciola.* 2½

5. Write notes on the following :

(a) Life history of *Schistosoma.* 2½

(b) Life history of *Ancylostoma.* 2½

(c) Structure of a Cnidoblast. 2½

SECTION–B

6. (a) Describe the structure and function of nuclear pores. 4½

(b) Write a note on nucleolus. 3

7. Write short notes on the following :

(a) Kinetochore

(b) Chromocentre

(c) β-Chromosome. 2½ ×3=7½

8. (a) Give an account of mitosis with diagrams. 5

(b) Why is meiosis called 'reductional division'? Which phase of meiosis is reductional? 2½

9. (a) What are protooncogenes? How are they involved in causing cancer? 4

(b) Explain the detailed structure of IgG. What are the various forms of immunoglobulins ? 3½

Roll No. ..... Total Pages : 2

GSE/D-19 **806**

ELECTRONICS

(Electronic Devices and Circuits–I)

Paper : I

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory.

Compulsory Question

1. (a) Explain drift and diffusion currents in semi-conductors.

(b) Explain Avlanche Breakdown in pn diode.

(c) Which transistor configuration is used for impedance matching and why ?

(d) Why CE configuration is mostly used in Amplifiers?

(2×4=8)

UNIT–I

2. (a) Explain the v-i characteristics of pn diode. 4

(b) What is voltage Regulation ? Explain a Zener diode voltage Regulator. 4

3. (a) Discuss a pn diode shunt clipper. 4

(b) Explain diode capacitance. 4

UNIT–II

4. (a) Explain the operation of a Bridge rectifier. 4

(b) Calculate the Ripple factor in a half wave rectifier. 4

5. Discuss the operation of a capacitor filter in a full wave Rectifier and derive an expression for the ripple factor. 8

UNIT–III

6. (a) Discuss the various currents flowing in a actively biased npn transistor. 4

(b) The reverse saturation current in a npn transistor in C.B. configuration is 15.5 μA. For a emitter current of 4 mA, collector current is 2.47 mA. Find out the value of current gain and base current. 4

7. Draw and explain a circuit to find the static characteristics of a npn transistor in C.E. configuration. Explain in details the input and output characteristics. 8

UNIT–IV

8. (a) Explain and draw the *h*-parameter model of a C.E. Transistor. 4

(b) State and prove Miller's theorem and its dual. 4

9. Explain the operation of a Emitter follower. Using the approximate *h*-parameter model for a emitter follower circuit, obtain the expression for A_I, A_V and Z_O. 8

Roll No.....

Total No. of page(s): 2

GSE/D-19: 807

Electronics Paper-I:Electronics Devices & Circuits-I

Time: 3 hrs]

[Max. Marks: 40

NOTE : Attempt *FIVE* questions in all. Question No. 1 is compulsory. Select *ONE* from each unit.

(Compulsory Question)

1. (a)	Define hole current. How are the electron-hole pairs formed ?	[1½]
(b)	Explain why a bridge rectifier would be preferred over two diode full wave rectifier.	[1½]
(c)	Define peak inverse voltage (PIV) in a rectifier circuit. How it affects the rectifier?	[1½]
(d)	Which transistor amplifier configuration is most versatile and why?	[1½]
(e)	Define diffusion and drift currents in semiconductors.	[2]
	UNIT –I	
2. (a)	What are the two types of capacitances across a PN junction? Which of these is more important in forward biasing?	[4]
(b)	What are the various breakdown mechanisms in a junction diode. Describe the working of a zener diode.	[4]
3. (a)	Explain the forward and reverse characteristics of a semiconductor diode.	[4]
(b)	Draw and explain the operation of biased shunt clipping circuits. Sketch the input & output waveforms.	[4]
	UNIT –II	
4. (a)	Explain the working of a bridge rectifier. What are its advantages over two diode full wave rectifier.	[4]

(b)	Draw and explain FWR with LC filter. Find the expression for the ripple factor.	[4]
5. (a)	Derive the expressions for ripple factor and efficiency of a centre tap full wave rectifier.	[4]
(b)	What is a voltage multiplier? Draw circuits of voltage tripler and quadrupler.	[4]
	UNIT – III	
6. (a)	What is Early effect? What are the consequences of base width modulation.	[4]
(b)	Define alpha, beta and gamma of a transistor and obtain the relationship between them.	[4]
7. (a)	Draw and explain the potential curves and minority carrier concentration of biased transistor.	[4]
(b)	Draw the input & output characteristics of CE transistor. Discuss the different regions of operation.	[4]
	UNIT –IV	
8. (a)	What is the conclusion of Ebers-Moll model of transistor? Explain.	[4]
(b)	State and prove Miller's theorem and its dual.	[4]
9. (a)	Find the expressions for transistor amplifier parameters in term of h- parameters.	[8]
(b)	Explain the use of Emitter follower.	[2]

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Roll No. ..... Total Pages : 3

GSE/D-19 **810**

COMPUTER SCIENCE

(Computer and Programming Fundamentals)

Paper–I

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) How does a keyboard in a computer work? 2

(b) Define storage capacity, access time access mode of Random access memory. 2

(c) What is machine language? Why it is required? 2

(d) Elaborate the concept of problem solving. 1

(e) What is a program loader? 1

UNIT–I

2. Why a computer system is called a data processor? Explain working of a digital computer using block diagram. 8

3. Compare magnetic disks and optical disks for data storage, storage capacity, access mechanism, and storage cost. 8

UNIT–II

4. Explain :

(a) Serial port.

(b) Parallel port.

(c) USB port.

(d) Bluetooth. 2×4

5. Elaborate the following function of operating system i.e.,

(a) Memory Management. 3

(b) Device Management. 3

(c) User login and Password. 2

UNIT–III

6. (a) Develop pseudo code to find roots of a quadratic equation $ax^2 + bx + c$. 5

(b) What are advantages and limitations of pseudo codes for computer program? 3

7. (a) Explain steps for drawing a decision table. 4

(b) Explain Bottom-up programming methodology with one example. 4

UNIT–IV

8. (a) An Array containing six numbers (i.e., 42, 29, 74, 10, 62, 57) are given. Develop selection sort method for arranging these numbers in ascending order. 5

(b) Explain linear search method for searching a data element in a group. 3

9. (a) Why high level languages are easier to learn and use? 4

(b) Differentiate a compiler and an interpreter as language translator. 4

Roll No. B0033917 Total Pages : 2

GSE/D-19 **811**

COMPUTER SCIENCE
(PC Software)
Paper–II

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all. Question number 1 is compulsory. In addition to compulsory question, student allotted will have to attempt *four* more questions selecting *one* question from each unit. All questions carry equal marks.

Compulsory Question

1. (a) Write short note on Windows Explorer. (2)

(b) Explain the concept of formatting in MS-Word. (2)

(c) What do you mean by pivot table in MS-Excel? (2)

(d) What is the significance of templates in PowerPoint? (2)

UNIT–I

2. What is the significance of operating system? Explain various features supported by Windows Accessories. (8)

3. Elaborate on the following :

(a) Mangling files and folders in Windows.

(b) Control Panel. (8)

UNIT–II

4. Explain various features of MS-Word with suitable examples. (8)

5. Elaborate on the following with examples in MS-Word :
   (a) Mail Merge.
   (b) Macros. (8)

UNIT–III

6. Explain Library functions supported by MS-Excel with suitable examples. (8)

7. (a) Explain working with charts in MS-Excel? Give suitable examples. (5)
   (b) Write short note on linking and consolidation in MS-Excel. (3)

UNIT–IV

8. Elaborate on the following concepts in PowerPoint :
   (a) Animations and Sound.
   (b) Creating, Manipulating and Enhancing Slides. (8)

9. Explain the concept of Organizational Charts and Word Art in PowerPoint. (8)

Roll No. ..... Total Pages : 2

GSE/D-19 **812**

COMPUTER APPLICATION
(Fundamentals of Computers and Windows Operating System)
Paper–I

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all. Question No. 1 is compulsory. Select *one* question from each unit.

Compulsory Question

1. (a) Define ASCII code. 2

(b) Define Ram. 2

(c) Define Recycle Bin. 2

(d) Define Cache Memory. 2

UNIT–I

2. (a) What is a computer ? Explain functional components of a computer in detail. 5

(b) Explain various capabilities and limitations of computer. 3

3. (a) Convert $(359)_{10} \rightarrow (\ )_2$ 2

$(214)_8 \rightarrow (\ )_2$ 2

(b) Write note on B.C.D. and E.B.C.D.I.C. codes. 4

UNIT–II

4. Write note on :

(a) Touch Screen.

(b) Light Pen. (4+4)

5. Explain monitor as display unit of computer. Give various characteristics and types of monitors. 8

UNIT–III

6. Explain significance of memory in computer system. Provide classification of computer memory and explain each type. 8

7. (a) Differentiate between magnetic disk and magnetic tape. 4

(b) Explain structure of Hard Disk. 4

UNIT–IV

8. (a) Define operating system. Justify why windows operating system is most popular operating system. 4

(b) Write short note on :

(i) My computer.

(ii) Windows explorer. (2+2)

9. What are different types of operating systems ? Explain in detail. 8

Roll No. ..... Total Pages : 2

GSE/D-19 **813**

COMPUTER APPLICATION

(Office Automation Tools)

Paper : II

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. Explain the following :

(a) Animation and sound effects.

(b) Spell and Thesaurus.

(c) Tabs and Indents.

(d) Linking worksheet and workbook. (4×2=8)

UNIT–I

2. What is use of MS-PowerPoint ? What is a slide ? Explain. Also explain different views of a slide. 8

3. What is Outlook Express ? Explain its features and uses. Also explain how to configure and use outlook express for accessing emails. 8

UNIT–II

4. Explain the area of use of MS-Word. Explain various menus and commands. 8

5. How can we make a new document in MS-Word ? Explain available text styles and text attributes, paragraph and page formatting. 8

UNIT–III

6. Explain about the structure of worksheet, to create, to save, to enter data and edit data in a worksheet. 8

7. Explain how to arrange multiple workbook ? Also explain inserting and deleting rows and columns, adjusting height and width of columns and rows. 8

UNIT–IV

8. Explain various mathematical operators in MS-Excel with example. 8

9. Explain various types of charts in MS-Excel. 8

Roll No. ..... Total Pages : 2

GSE/D-19 **816**

BIOTECHNOLOGY
(Introduction to Biotechnology)
Paper : I

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *five* questions in all, selecting *two* questions from each unit. Question No. 1 is compulsory.

Compulsory Question

1. Give brief answer of the following :

(a) What is suspension culture ?

(b) Expand VNTR.

(c) Define Somaclonal variations.

(d) What is Trade secret ?

(e) Define Transgenic Animals.

(f) What are single cell proteins ?

(g) Define vaccines.

(h) What are Restriction enzymes ? (1×8=8)

UNIT–I

2. Write short note on the following :

(a) Immobilized Enzymes. 4

(b) Applications of Genetic Engineering. 4

3. Discuss plant tissue culture and its various applications. 8

4. (a) What are monoclonal antibodies and how these are being produced ? 4

(b) Write short note on Recombinant DNA-Technology. 4

UNIT–II

5. Write notes on the following :

(a) Role of Biotechnology in Food industry. 4

(b) Bioremediation. 4

6. What is IPR ? Discuss its advantages and disadvantages. 8

7. (a) Discuss role of Biotechnology in treatment of waste water. 4

(b) How can Biotechnology help the farmers ? 4