[This question paper contains 8 printed pages.]

Roll No. .....

Sr. No. of Question Paper : 3273 **E**

Unique Paper Code : 62275604

Name of the Paper : Principles of Macroeconomics

Name of the Course : **BA (Prog.) Eco, GE**

Semester : VI

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. All questions are divided into sections **A** and **B**. Attempt any **5** out of **7** questions from each section.
3. **Section A** has short answer questions and each carries **5** marks whereas **Section B** contains long answer questions and **10** marks.
4. Answers may be written either in English or Hindi; but the same medium should be used throughout the paper.

P.T.O.

छात्रों के लिए निर्देश

1. इस प्रश्न-पत्र के मिलते ही ऊपर दिए गए निर्धारित स्थान पर अपना अनुक्रमांक लिखिए ।

2. सभी प्रश्नों को **खंड – अ** तथा **खंड – ब** में विभाजित किया गया है। प्रत्येक खंड में से 7 प्रश्नों में से किन्हीं 5 प्रश्नों के उत्तर दीजिए।

3. **खंड अ** में लघु उत्तरीय प्रश्न हैं एवं प्रत्येक 5 अंक का हैं जबकि **खंड ब** में में दीर्घ उत्तरीय प्रश्न हैं और प्रत्येक 10 अंक का हैं।

4. इस प्रश्न-पत्र का उत्तर अंग्रेजी या हिंदी किसी एक भाषा में दीजिए, लेकिन सभी उत्तरों का माध्यम एक ही होना चाहिए ।

SECTION – A

1. Discuss the following terms :–

   (i) Aggregation

   (ii) Macroeconomic policies

   निम्नलिखित शर्तों पर चर्चा करें :-

   (i) एकत्रीकरण

   (ii) व्यापक आर्थिक नीतियां

2. Explain the concept of the uses-of-saving identity.

   यूज-ऑफ-सेविंग आइडेंटिटी की अवधारणा को समझाइए ।

3. Discuss the concept of multiplier. (Diagram is required).

   गुणक की अवधारणा पर चर्चा करें। (आरेख आवश्यक है)

4. What are the two components of the user cost of capital?

   पूंजी की उपयोगकर्ता लागत के दो घटक कौन से हैं?

5. What is the full employment budget surplus?

   पूर्ण रोजगार बजट अधिशेष क्या है?

6. What are the motives for holding money?

   मुद्रा रखने के उद्देश्य क्या हैं?

7. Explain the relationship between bond price and rate of interest.

बॉन्ड की कीमत और ब्याज दर के बीच संबंध को समझाइए।

Section – B

1. What is macroeconomics? Mention the issues of macroeconomics that macroeconomists address.

समष्टि अर्थशास्त्र क्या है? समष्टि अर्थशास्त्र के उन मुद्दों का उल्लेख करें जिन्हें समष्टि अर्थशास्त्री संबोधित करते हैं।

2. (a) Suppose nominal GDP is $66,000 and real GDP is $62,000, find the value of the GDP-deflator.

(b) List the four components of total spelling.

(अ) मान लें कि नाममात्र जीडीपी $66,000 है और वास्तविक जीडीपी $62,000 है, जीडीपी-डिफ्लेटर का मूल्य ज्ञात करें।

(ब) कुल स्पेलिंग के चार घटकों की सूची बनाएं।

3. Give two equivalent ways of describing equilibrium in the goods market. Use diagrams to show how goods market equilibrium is achieved.

वस्तु बाजार में संतुलन का वर्णन करने के दो समान तरीके दीजिए। वस्तुओं के बाजार संतुलन को कैसे प्राप्त किया जाता है यह दिखाने के लिए आरेखों का उपयोग करें।

4. What is the budget surplus? Explain the effect of government purchases on the budget surplus.

बजट अधिशेष क्या है? बजट अधिशेष पर सरकारी खरीद के प्रभाव की व्याख्या करें।

5. Following information about an economy are given as :–

$C = 50 + 0.8YD$

$I = Rs. 70$

$G = Rs. 200$

$TR = Rs. 100$

$t = 0.20$

(a) Calculate the equilibrium level of income in this model

(b) Calculate also the budget surplus

(c) Suppose that t increases to 0.25. What is the new equilibrium income?

एक अर्थव्यवस्था के बारे में निम्नलिखित जानकारी इस प्रकार दी जाती है :-

C = 50 + 0.8YD

I = 70 रुपये

G = 200 रुपये

TR = 100 रुपये

t = 0.20

(अ) इस मॉडल में आय के संतुलन स्तर की गणना करें।

(ब) बजट अधिशेष की भी गणना करें।

(स) मान लीजिए कि t बढ़कर 0.25 हो जाता है। नई संतुलन आय क्या है?

6. Define net export function. An increase in the marginal propensity to import reduces the equilibrium income level in an open economy, while an increase in autonomous export increases the equilibrium level of income. Explain with the help of a graph.

शुद्ध निर्यात फलन को परिभाषित कीजिए। आयात की सीमांत प्रवृत्ति में वृद्धि एक खुली अर्थव्यवस्था में संतुलन आय स्तर को कम करती है, जबकि स्वायत्त निर्यात में वृद्धि आय के संतुलन स्तर को बढ़ाती है। एक ग्राफ की सहायता से समझाइए।

7. (a) Explain financial market equilibrium with the help of money supply and money demand analysis.

(b) What is the money multiplier? If checkable deposits (c) is zero, and the reserve ratio (θ) is 0.1, find the value of the money multiplier.

P.T.O.

(अ) मुद्रा पूर्ति तथा मुद्रा माँग विश्लेषण की सहायता से वित्तीय बाजार संतुलन की व्याख्या कीजिए।

(ब) धन गुणक क्या है? यदि चेक करने योग्य जमा (सी) शून्य है और आरक्षित अनुपात (θ) 0.1 है, तो धन गुणक का मूल्य पाएं।

[This question paper contains 4 printed pages.]

Your Roll No.....

आपका अनुक्रमांक.....

Sr. No. of Question Paper : 3274 **E**

Unique Paper Code : 62275607

Name of the Paper : THE INDIAN ECONOMY

पेपर का नाम : भारतीय अर्थव्यवस्था

Name of the Course : **B.A. (Prog.) Eco. GE**

पाठ्यक्रम का नाम : **बी.ए. (प्रोग्राम) इको. जीई**

Semester/Scheme/Mode : VI

सेमेस्टर/स्कीम/मोड

Duration : 3 Hours Maximum Marks : 75

समय : 3 घण्टे पूर्णांक : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. Answers may be written either in English or Hindi; but the same medium should be used throughout the paper.

P.T.O.

छात्रों के लिए निर्देश

1. इस प्रश्न-पत्र के मिलते ही ऊपर दिए गए निर्धारित स्थान पर अपना अनुक्रमांक लिखिए ।

2. किन्हीं **पाँच** प्रश्नों के उत्तर दीजिए ।

3. इस प्रश्न-पत्र का उत्तर अंग्रेजी या हिंदी किसी एक भाषा में दीजिए, लेकिन सभी उत्तरों का माध्यम एक ही होना चाहिए ।

1. Give a general overview of the Indian economy since Independence.

   स्वतंत्रता के बाद से भारतीय अर्थव्यवस्था का एक सामान्य अवलोकन दें।

2. Explain the growth and structural change.

   विकास और संरचनात्मक परिवर्तन की व्याख्या करें।

3. Explain the Indian economy from a comparative perspective.

   भारतीय अर्थव्यवस्था को तुलनात्मक दृष्टिकोण से समझाइए।

4. Explain the issues of poverty and inequality.

   गरीबी और असमानता के मुद्दों की व्याख्या करें।

5. Explain the issues of education and gender.

   शिक्षा और लिंग के मुद्दों की व्याख्या करें।

6. Extensively explain the agricultural sector's contribution to the Indian economy.

   भारतीय अर्थव्यवस्था में कृषि क्षेत्र के योगदान को विस्तृत रूप से समझाइए।

7. How have industry and service sectors fared in India?

   भारत में उद्योग और सेवा क्षेत्रों का प्रदर्शन कैसा रहा है?

8. Explain international trade in the Indian context.

भारतीय संदर्भ में अंतर्राष्ट्रीय व्यापार की व्याख्या करें।

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3295

Unique Paper Code : 62055636

Name of the Paper : अस्मितामूलक विमर्श और हिन्दी साहित्य

Name of the Course : **B.A. (Prog.) Hindi- CBCS-GE**

Semester : VI

Duration : 3 Hours Maximum Marks : 75

छात्रों के लिए निर्देश

1. इस प्रश्न-पत्र के मिलते ही ऊपर दिए गए निर्धारित स्थान पर अपना अनुक्रमांक लिखिए।
2. सभी प्रश्न अनिवार्य हैं।

1. निम्नलिखित अवतरणों में से किन्हीं दो की सप्रसंग व्याख्या कीजिए। (10×2=20)

(क) बभने के लेखे हम भिखिय न माँगबजाँ,
ठकुर के लेखे नहीं लउरी चलाइबि।

सहुआ के लेखे नहि डांडी-हम जोरबजाँ,

अहिरा के लेखे न कबित्त हम जोरजाँ,

पबड़ी न बनि के कचहरी में जाइबि।।

अपने पहसनबा कै पइसा कमादबजाँ,

घर भर मिलि जुलि बाँटि-चोटि खदबि ।

अथवा

क्या तुम जानते हो

एक स्त्री के समस्त रिश्ते का व्याकरण?

बता सकते हो तुम

एक स्त्री को स्त्री - दृष्टि से देखते

उसके स्त्रीत्व की परिभाषा?

अगर नहीं

तो फिर क्या जानते हो तुम

रसोई और बिस्तर के गणित से परे

एक स्त्री के बारे में...

(ख) अतः रात के समय मुझे टड़वाँ गाँव की एक दुकान से मिट्टी का तेल लाने के लिए भेजा गया। मैं अँगोछे में आधा सेर जौ बांधकर तेल लेने चल पड़ा। ऐसे किसी भी काम के लिए घरवाले हमेशा रात के समय मुझे ही भेजा करते थे, जिसका एकमात्र

कारण यह था कि अपशकुन होने के कारण मेरा चाहे जो भी अनिष्ट हो जावे, किन्तु घर के किसी अन्य व्यक्ति का कुछ न बिगड़े। यहाँ तक कि घर का कोई आदमी बरहलगंज बाजार जाता और लौटते समय रात हो जाती, तो हमेशा मुझे मुर्दहिया के पास भेजकर बाजार गए आदमी को जोर से चिल्लाकर पुकारने को कहा जाता था। मुर्दहिया के सन्नाटे से लगाई गई मेरी आवाज बहुत दूर तक जाती, जिसे सुनकर बाजार से लौटता हुआ आदमी मेरी ही तरह चिल्लाकर कहता : 'आवत हई' ।

अथवा

कैसा अनाथ बचपन था। अम्मा ने कभी मुझे गोद में उठाकर चूमा नहीं। मैं चुपचाप घंटों उनके कमरे के दरवाजे पर खड़ी रहती । शायद अम्मा मुझे भीतर बुला लें। शायद.... ही, शायद अपनी रजाई में सुला लें। मगर नहीं, एक शाश्वत दूरी बनी रही हमेशा हम दोनों के बीच। अम्मा मेरी बातों को समझ नहीं पाती थी।

9. दलित विमर्श की अवधारणा को स्पष्ट करते हुए फुले और अम्बेडकर की विचारधारा का तुलनात्मक अध्ययन कीजिए।

अथवा

जल, जंगल और जमीन की समस्याओं के सन्दर्भ में आदिवासी जीवन की जटिलताओं का विश्लेषण कीजिए। (10)

3. ओमप्रकाश बाल्मीकि की 'सलाम' कहानी की सम्वेदना पर प्रकाश डालिए।

अथवा

जयप्रकाश कर्दम की कहानी 'मोहरे' के प्रतिपाद्य पर विचार कीजिए । (10)

4. अनामिका की कविता 'स्त्रियाँ' के भाव - सौन्दर्य का उद्घाटन कीजिए।

अथवा

हीरा डोम की 'अछूत की शिकायत' कविता हिन्दी दलित साहित्य का प्रस्थान-बिन्दु है- इस कथन से आप कहाँ तक सहमत हैं? (10)

5. दलित आत्मकथा-लेखन की परम्परा में 'मुर्दहिया' के स्थान का निरूपण कीजिए।

अथवा

प्रभा खेतान की रचना 'अन्या से अनन्या तक' की अन्तर्वस्तु का विवेचन कीजिए । (10)

6. निम्नलिखित में से **किन्हीं दो** पर टिप्पणियाँ लिखिए। (7+8=15)

(i) 'धूणी तपे तीर' का महत्त्व

(ii) आदिवासियों के सम्मुख उपस्थित चुनौतियाँ

(iii) 'सोनवा का पिंजरा' में चित्रित यथार्थ

(iv) निर्मला पुतुल

(1000)

[This question paper contains 8 printed pages.]

'25 MAY 2023

Your Roll No.....

Sr. No. of Question Paper : 4245

Unique Paper Code : 12275403

Name of the Paper : GE = Public Finance

Name of the Course : **B.A. (Hons) Economics Generic Elective**

Semester : IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. The question paper is divided **into two sections**
3. Attempt **any five** questions. Selecting **three from section A** and **two from section B.**
4. Simple calculator is permissible.
5. Answers may be written either in English or Hindi; but the same medium should be used throughout the paper.

P.T.O.

छात्रों के लिए निर्देश

1. इस प्रश्न-पत्र के मिलते ही ऊपर दिए गए निर्धारित स्थान पर अपना अनुक्रमांक लिखिए ।
2. प्रश्न पत्र दो खण्डों में विभाजित हैं।
3. **किन्हीं पाँच** प्रश्नों के उत्तर दीजिए। **सेक्शन ए से तीन** और **सेक्शन बी से दो** का चयन करना।
4. साधारण कैलकुलेट की अनुमति है।
5. इस प्रश्न-पत्र का उत्तर अंग्रेजी या हिंदी किसी एक भाषा में दीजिए, लेकिन सभी उत्तरों का माध्यम एक ही होना चाहिए ।

SECTION A

खंड ए

1. (a) Write down the three major functions of government in a mixed economy. Provide examples to show that these functions often overlap in practice. (9)

मिश्रित अर्थव्यवस्था में सरकार के तीन प्रमुख कार्य लिखिए। उदाहरण देकर समझाइये कि व्यवहार में ये कार्य अक्सर ओवरलैप होते हैं।

(b) What is meant by 'incompleteness of markets' as a reason of market failure. Explain with the help of suitable diagram. (6)

बाजार विफलता के कारण के रूप में 'बाजारों की अपूर्णता' का क्या अर्थ है। उपयुक्त आरेख की सहायता से समझाइए।

2. (a) Explain the provisioning of public goods in a general equilibrium model and show how the economy will attain efficient mix of public and private goods. (9)

एक सामान्य संतुलन मॉडल में सार्वजनिक वस्तुओं के प्रावधान की व्याख्या करें। और दिखाएं कि अर्थव्यवस्था सार्वजनिक और निजी वस्तुओं के कुशल मिश्रण को कैसे प्राप्त करेगी।

(b) What does Second welfare theorem states for welfare maximization? (6)

कल्याण अधिकतमकरण के लिए द्वितीय कल्याण प्रमेय क्या बताता है ?

3. (a) Define externalities. "The existence of externalities distorts efficient market outcomes for the society as a whole". Discuss. (7)

बाह्यताओं को परिभाषित करें। ''बाह्यताओं का अस्तित्व समाज के लिए कुशल बाजार परिणामों को विकृत करता है''। चर्चा कीजिए।

(b) How Pigouvian tax and Pigouvian subsidy schemes brings equally efficient outcomes. Which mechanism tax or subsidy is better? (8)

पिगौवियन टैक्स और पिगौवियन सब्सिडी योजनाएं समान रूप से कुशल परिणाम कैसे लाती हैं। कौन सा तंत्र कर या सब्सिडी बेहतर है ?

4. (a) Explain the role of elasticity of demand and supply in distribution of burden of a product tax between buyer and sellers. Are there any other factors that influence the economic incidence of tax? (9)

खरीदार और विक्रेता के बीच उत्पाद कर के बोझ के वितरण में मांग और आपूर्ति की लोच की भूमिका की व्याख्या करें। क्या कोई अन्य कारक हैं जो कर की आर्थिक घटनाओं को प्रभावित करते हैं ?

(b) Explain the concept of burden of tax. What is meant by statutory and economic incidence of a tax? (6)

कर के भार की अवधारणा की व्याख्या कीजिए। कर के वैधानिक और आर्थिक भार क्या अभिप्राय है ?

5. Write short note on **Any Two**

किन्हीं दो पर संक्षिप्त टिप्पणी लिखिए :

(a) First Welfare Theorem of Welfare Economics

कल्याण अर्थशास्त्र का पहला मौलिक प्रमेय

(b) Pareto optimality

परेटो इष्टतमता

(c) Coase Theorem

कोस प्रमेय (7.2×2=15)

SECTION B

खंड बी

6. (a) Elaborate the Mark up rule for setting price of Petroleum Oil & Lubricant products and sharing revenue space between Centre and State in context with D K Srivastava's article. (9)

डी के श्रीवसस्तव के लेख के संदर्भ में पेट्रोलियम तेल और स्नेहक उत्पादों की कीमत निर्धारित करने और केंद्र और राज्य के बीच राजस्व स्थान साझा करने के लिए मार्क अप नियम को विस्तृत करें।

(b) What are the three important tools that the Central bank can use to control the money supply? Discuss. (6)

मुद्रा आपूर्ति को नियंत्रित करने के लिए केंद्रीय बैंक द्वारा उपयोग किए जा सकने वाले तीन महत्वपूर्ण उपकरण कौन-से हैं ? चर्चा कीजिये।

7. Discuss the Recommendations of Fifteenth Finance Commission with regard to "strengthen cooperative federalism, improve the quality of public spending and help protect fiscal stability". (15)

"सहकारी संघवाद को मजबूत करने, सार्वजनिक व्यय की गुणवत्ता में सुधार करने और वित्तीय स्थिरता की रक्षा के संबंध में पंद्रहवें वित्त आयोग की सिफरिशों पर चर्चा कीजिये।

P.T.O.

8. What are the key features of Goods and Service tax? How does GST satisfy Fiscal Autonomy and Harmonization? (15)

गुड्स एंड सर्विस टैक्स की प्रमुख विशेषताएं क्या हैं? GST राजकोषीय स्वायत्तता और सामंजस्य को कैसे संतुष्ट करता है ?

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4255

Unique Paper Code : 12035909

Name of the Paper : Bestsellers and Genre Fiction

Name of the Course : **English: Generic Elective**

Semester : II/IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **THREE** questions from **Part A** and any **THREE** Questions from **Part B**.

PART A

(Attempt any **3** Questions. Total marks – **3×10=30** marks)

Write short notes on the following :

1. Ayurvati in *The Immortals of Meluha*

2. Maps in *Paper Towns*.

3. The leopard claw pendant in *The Blue Umbrella*

4. Obed Ramotswe in *The No. 1 Ladies Detective Agency*

5. Genre fiction

PART B

(Attempt any **3** Questions. Total marks – **3×15=45** marks)

6. Discuss the significance of the title of the novel *Paper Towns*.

7. In *The Immortals of Meluha*, Amish Tripathi has compared and contrasted codes of conduct, values and ways of life to establish the fact that there is no absolute right or wrong in cultural context. Comment on the text in the light of this statement.

8. "*The Blue Umbrella* tells us a story about life in the city and the hills, while also exploring the world of children". Do you agree with this statement? Give your views.

9. In an interview, Alexander McCall Smith says that "Mma Ramotswe is a kind of agony aunt, rode up with a psychologist and a general comfort figure." In light of this statement, discuss the portrayal of the female detective in *The No. 1 Ladies ' Detective Agency*.

P.T.O.

10. Do you agree with the view that genre fiction is a page-turning, plot-driven entertainment that doesn't hold any other value for its readers? Discuss with reference to any two texts in your course.

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4273 E

Unique Paper Code : 12055401

Name of the Paper : हिदीं का वैश्विक परिदृश्य

Name of the Course : बी. ए. (ऑनर्स) हिदीं (सामान्य ऐच्छिक पाठयक्रम) (GE)

Semester : IV (CBCS)

Duration : 3 Hours Maximum Marks : 75

छात्रों के लिए निर्देश

1. इस प्रश्न-पत्र के मिलते ही ऊपर दिए गए निर्धारित स्थान पर अपना अनुक्रमांक लिखिए।
2. सभी प्रश्नों के उत्तर दीजिए।

1. हिंदी भाषा की वैश्विक स्थिति स्पष्ट कीजिए।

अथवा

हिंदी के प्रचार-प्रसार से संबद्ध प्रमुख वैश्विक संस्थानों का महत्त्व स्पष्ट कीजिए। (15)

P.T.O.

2. हिंदी के विश्व-संदर्भ पर प्रकाश डालिए।

अथवा

संयुक्त राष्ट्र में हिंदी की स्थिति का आकलन कीजिए। (15)

3. हिन्दी के वैश्विक प्रसार में सिनेमाई गीतों की भूमिका का उल्लेख कीजिए।

अथवा

हिंदी को विश्व-भाषा बनाने में रेडियो कार्यक्रमों के योगदान को रेखांकित कीजिए। (15)

4. अंतरराष्ट्रीय हिंदी सम्मेलनों के उद्देश्य एवं महत्त्व पर प्रकाश डालिए।

अथवा

21 वीं सदी की हिंदी की वैश्विक चुनौतियों का विश्लेषण कीजिए। (15)

5. किन्हीं **दो** पर टिप्पणियां लिखिए :-

(क) वैश्वीकरण और हिंदी साहित्य

(ख) हिंदी की ई-पत्रिकाएँ

(ग) हिंदी और फ़ेसबुक

(घ) अंतरराष्ट्रीय हिंदी सम्मेलनों की परिकल्पना (8+7=15)

(1000)

[This question paper contains 4 printed pages.]

Your Roll No...............

आपका अनुक्रमांक............

Sr. No. of Question Paper : 4290 **E**

Unique Paper Code : 12325902

Name of the Paper : Contemporary Political Economy

Name of the Course : **B.A. Hons.**

पाठ्यक्रम का नाम : **बी.ए. (ऑनर्स)**

Semester/Annual : IV

सेमेस्टर/वार्षिक : IV

Duration : 3 Hours Maximum Marks : 75

समय : 3 घण्टे पूर्णांक : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.

2. Attempt **Any Four** questions.

3. **All questions** carry equal marks

4. Answers may be written either in English or Hindi but the same medium should be followed throughout the paper.

P.T.O.

छात्रों के लिए निर्देश

1. इस प्रश्न-पत्र के मिलते ही ऊपर दिए गए निर्धारित स्थान पर अपना अनुक्रमांक लिखिए ।
2. किन्हीं **चार** प्रश्नों के उत्तर दीजिए ।
3. **सभी प्रश्नों** के अंक समान हैं।
4. इस प्रश्न-पत्र का उत्तर अंग्रेजी या हिंदी किसी एक भाषा में दीजिए, लेकिन सभी उत्तरों का माध्यम एक ही होना चाहिए ।

1. Define Political economy? Discuss the relationship between politics, economy and society.

राजनीतिक अर्थव्यवस्था परिभाषित कीजिए ? राजनीति, अर्थव्यवस्था और समाज के संबंधों की विवेचना कीजिये।

2. Critically examine the changing notion of sovereignty of the state in the era of globalization.

भूमंडलीकरण के युग में राज्य की संप्रभुता की बदलती अवधारणा का समालोचनात्मक परीक्षण कीजिये।

3. Discuss the political economy of migration and its impact on urban life in India.

प्रवसन की राजनीतिक अर्थव्यवस्था और भारत के शहरी जीवन पर इसके प्रभाव की विवेचना कीजिये।

4. Discuss the role of Multi National Corporations in the era of globalization. How have these corporations created a systematic pattern of uneven development?

भूमंडलीकरण के दौर में बहुराष्ट्रीय निगमों की भूमिका की विवेचना कीजिए। इन निगमों ने असमान विकास का एक व्यवस्थित पैटर्न कैसे निर्मित किया है ?

5. Discuss the concept of Human Development in the context of under development in developing countries.

विकासशील देशों के अल्पविकास के संदर्भ में मानव विकास की अवधारणा की व्यख्या कीजिए।

6. Critically assess the principles of Gandhian political philosophy.

गांधीवादी राजनीतिक दर्शन के सिद्धांतों का समालोचनात्मक परीक्षण कीजिये।

7. Examine the environmental concerns associated with big dams.

बड़े बांधों के साथ जुड़े पर्यावरण संबंधी मुद्दों का परीक्षण कीजिए।

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

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

(a) Transition from feudalism to capitalism

सामंतवाद से पूंजीवाद में परिवर्तन

(b) Environmental crises

पर्यावरणीय संकट

(c) Gender and development

जेंडर और विकास

(d) Marxist approach to political economy

राजनीतिक अर्थव्यवस्था का मार्क्सवादी उपागम

[his question paper contains 4 printed pages.]

Your Roll No.....

No. of Question Paper : 4355 **E**

ique Paper Code : 12555423

me of the Paper : Fitness and Exercise Management

me of the Course : **GE : Physical Education**

mester : IV-May/June 2023

ration : 2 Hours Maximum Marks : 50

tructions for Candidates

Write your Roll No. on the top immediately on receipt of this question paper.

Attempt any **five** questions.

All questions carry equal marks.

Answers may be written either in English or Hindi; but the same medium should be used throughout the paper.

ों के लिए निर्देश

इस प्रश्न-पत्र के मिलते ही ऊपर दिए गए निर्धारित स्थान पर अपना अनुक्रमांक लिखिए ।

P.T.O.

2. किन्हीं पाँच प्रश्नों का उत्तर दें।
3. सभी प्रश्नों के अंक समान हैं।
4. इस प्रश्न-पत्र का उत्तर अंग्रेजी या हिंदी किसी एक भाषा में दीजिए, ले सभी उत्तरों का माध्यम एक ही होना चाहिए।

1. What are the different components of physical fitne How can flexibility be assessed?

शारीरिक फ़िटनेस के विभिन्न घटक कौन से हैं? लचीलेपन आकलन कैसे किया जा सकता है?

2. Define Cardio-respiratory Endurance. What is t importance of Cardio-respiratory Endurance and assessment? Describe the various Assessme modalities.

हृद्-श्वसन क्षमता को परिभाषित कीजिए। हृद्-श्वसन क्षमता उसके मूल्यांकन का महत्व क्या है? विभिन्न मूल्यांकन विधियों का वर्ण कीजिए।

3. Why is it important to measure energy expenditure Describe the ways through which energy expenditur can be measured.

ऊर्जा व्यय को मापना क्यों महत्वपूर्ण है? उन तरीकों का वर्णन करें जिनसे ऊर्जा व्यय को मापा जा सकता है।

4. Why exercises are important for Children and Youth? Explain various kinds of exercises and activities that they can be engage in.

व्यायाम बच्चों और युवाओं के लिए क्यों जरूरी है? वे विभिन्न प्रकार के व्यायाम और गतिविधियाँ का वर्णन करें जिनमें वे संलग्न हो सकते हैं।

5. What is Diabetes? Explain its impact on a human being? What are the exercises or activities and precautions to prevent or manage the same?

मधुमेह क्या है? इसके मनुष्य पर पड़ने वाले प्रभाव का वर्णन कीजिए। इसे रोकने या प्रबंधित करने के लिए कौन से व्यायाम या गतिविधियाँ और सावधानियां हैं?

6. Describe the Principles of Training for development and maintenance of fitness components.

फ़िटनेस घटकों के विकास और रखरखाव के लिए प्रशिक्षण के सिद्धांतों का वर्णन करें।

7. Describe why it is important to set Fitness Goals. How can effective fitness goals be set?

P.T.O.

बताएं कि फ़िटनेस लक्ष्य तय करना क्यों जरूरी है. प्रभावी फ़िटनेस लक्ष्य कैसे निर्धारित किए जा सकते हैं?

8. What is a Fitness Module? How can an effective Fitness module be made?

फ़िटनेस मॉड्यूल क्या है? एक प्रभावी फ़िटनेस मॉड्यूल कैसे बनाया जा सकता है?

9. Write short notes on **any Two** of the following :

निम्नलिखित में से **किन्हीं दो** पर संक्षिप्त टिप्पणियाँ लिखिए :

(a) Assessment of Muscular Endurance

पेशीय सहनशक्ति का आकलन

(b) Weight Management Exercises

वजन प्रबंधन व्यायाम

(c) Health Appraisal

स्वास्थ्य मूल्यांकन

(d) First Aid

प्राथमिक चिकित्सा

[This question paper contains 8 printed pages.]

27 MAY 2023

Your Roll No.....

Sr. No. of Question Paper : 6017

Unique Paper Code : 32165201

Name of the Paper : Plant Ecology and Taxonomy

Name of the Course : **Botany : G.E. for Honours**

Semester : II

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **Section A** and **B** on SEPARATE SHEETS. Q. No. **1** of **both** sections is compulsory.
3. Attempt **three** questions from **Section A** and **three** questions from **Section B** including question number **1** of **both** sections.
4. Attempt **All** parts of the question together.

P.T.O.

Section A

1. (a) Define any **five** of the following : (5×1=5)

(i) Ecosystem

(ii) Food chain

(iii) Fleliophytes

(iv) Ecotone

(v) Pedogenesis

(vi) Hygroscopic water

(vii) Niche

(b) Fill in the blanks : (5×12=2.5)

(i) The instalment used to measure relative humidity is _____ .

(ii) Pyramid of _____ is always upright.

(iii) Partially decomposed finely divided amorphous organic matter is known as _____ .

(iv) _____ fraction of the soil is the main source of nutrients and cation exchange capacity.

(v) Detritivores are the microbes that feed on _____ .

2. Differentiate between the following : (5×3=15)

(i) Food chain and food web

(ii) Primary and secondary succession

(iii) Natural and artificial ecosystem

(iv) Hygroscopic and capillary water

(v) r and k selection

3. Write short notes on any **three** of the following : (3×5=15)

(i) Soil profile

(ii) Endemism

(iii) Shelford's law of tolerance

(iv) Light as an ecological factor

(v) Characteristic features of the community

4. (a) Elaborate on biogeochemical cycle of Nitrogen with the help of suitable illustration and discuss the role of industrialization in the changes. (8)

(b) Explain the process of soil weathering? Discuss the factors responsible for soil weathering. (7)

Section – B

1. (a) Match the following : (5×1½=2.5)

(i) Father of taxonomy	(a) Engler and Prantl
(ii) Forest Research Institute	(b) J.D. Hooker
(iii) Phylogenetic system of classification	(c) Dehradun
(iv) Numerical taxonomy	(d) Carl Linnaeus
(v) Flora of British India	(e) Sokal and Sneath

(b) Give the alternative names of the following families : (1×5=5)

Compositae, Graminae, Leguminosae, Labiatae, Cruciferae

2. Write short notes on any **three** of the following : (3×5=15)

(i) Keys

(ii) Typification

(iii) Principle of priority and its limitation

(iv) Cladistics

(v) Herbarium techniques and functions.

3. (a) Define any **five** of the following : (5×1=5

(i) OTU

(ii) Phenograms

(iii) Annotation label

(iv) Taxonomic hierarchy

(v) Taxonomic rank

(vi) Lectotype

(b) Differentiate between any **two** : (2.5×2=5)

(i) Cladogram and phenogram

(ii) Flora and Manual

(iii) Artificial and natural system of classification

4. (a) Compare the classification system of Bentham and Hooker with that of Engler and Prantl. (7)

(b) Write down the principle of ICN. (5)

(c) Explain the following : (1×3=3)

(i) *Cerasns cornuta* Wall, ex Royle

P.T.O.

(ii) *Delphinium viscosum* Hook.f. et Thomson

(iii) *Stellaria media* (L) Will

[This question paper contains 12 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6025 **E**

Unique Paper Code : 32345202

Name of the Paper : Database Management Systems

Name of the Course : **Generic Elective (Computer Science) For all Hons**

Year of Admission : 2019, 2020 & 2021

Semester : II

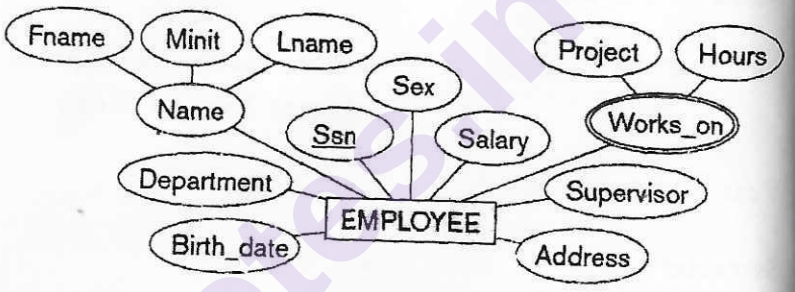
Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. **Section – A** is compulsory.
3. Attempt any **five** questions from **Section – B**.
4. Parts of a question should be attempted together.

SECTION – A

1. (a) Identify Composite and Multivalued attributes in the following diagram – (2)



(b) Consider the set of FDs, F for a relation R(A,B,C,D,E):

$F=\{A\rightarrow B,\ AB\rightarrow C,\ D\rightarrow AC,\ D\rightarrow E\}$

What will be the candidate key for R? Is this relation in 2NF, why? (3)

(c) What is Entity Integrity constraint in a relation? Explain, with example, why Primary key cannot be Null in an entity. (3)

(d) Consider the following relations (the Primary keys are underlined) : (7)

WORKER(WORKER_ID number, FIRST_NAME char(20), LAST_NAME char(20), SALARY number, JOINING_DATE Date, DEPARTMENT char(10))

BONUS(WORKER_ID number, BONUS_DATE date, BONUS_AMOUNT number)

TITLE(WORKER_ID number, WORKER_TITLE char (10) AFFECTED_FROM date)

Note: WORKER_TITLE can be Manager, Assistant, Secretary etc.

(i) Write an SQL query to fetch unique values of DEPARTMENT.

(ii) Write an SQL query to print details of the Workers whose FIRST_NAME ends with 'a'.

(iii) Write an SQL query to print the details of worker who has received maximum amount of bonus.

P.T.O.

(iv) Write an SQL query to print details of the 'Manager' Workers with SALARY in the range of Rs. 100000 and Rs. 500000.

(e) In the following relations identity all the Candidate Keys : (2)

Suppliers(*sid*: integer, *sname:* string, *address:* string, *panNumber:* string)

Parts(*pid:* integer, *pname:* string, *color:* string)

Catalog(*sid*: integer, *pid:* integer, *cost:* real)

Note: **Supplier**(identifxed by *sid)* can supply multiple **Parts**(identified by *pid).*

The information about what **Parts** can be supplied by a Supplier is kept in **Catalog**.

(f) What all anomalies can be caused if a table is dropped from database? (2)

(g) What is the difference between a Database Schema and a Database State? (2)

(h) Consider the following relations : (4)

Library_Books

AccNo	Title	Author	Dept	PurDate	Price
A101	Python Programming	Lafore	CS	3/3/2020	750
A102	R Programming	Navathe	Maths	4/7/2021	450
A103	Statistics	Rosen	Economics	6/2/2020	475
A104	Algebra	Navathe	Maths	6/9/2019	600
A105	Probability	Diesel	Maths	9/5/2022	700

Issued_Books

AccNo	Borrower
A102	Ritwik
A105	Rhea
A104	Arena
A105	Timothy
A103	John

Give output of the following queries :

(i) Select AccNo, Title, Author, Dept

from Library_Books

where Dept = "Maths" and Author = "Navathe";

(ii) Update Library_Books

set Dept = "CS"

where Title = "R Programming";

(iii) Select * from Library_Books

where Price>500 or PurDate between '7/5/2019' and '4/8/2021';

(iv) Select AccNo, Title, Dept

from Library_Books

where Dept = "CS";

Section – B

2. (a) What are the responsibilities of a Database Administrator and Database Designer? (4)

(b) Consider the following relations for a database that keeps track of business trips 6 of salespersons in a sales office: (6)

SALESPERSON(Ssn, Name, Start_year, Dept_no)

TRIP(Trip_id, Ssn, From_city, To_city, Departure_date, Return_date)

EXPENSE(Trip_id, Account#, Amount)

One trip can be charged to one or more accounts. Construct diagram for this Database Schema, specifying the entity integrity constraints and referential integrity constraints for this schema. Please state any assumptions you make.

3. Consider the following relational database : (10)

EMPLOYEE (emp_id, emp_name, dept_id, contact_no, email_id)

DEPARTMENT (dept_id, dept_name, dept_off, mgr_id)

Give SQL queries for the following :

(i) Select the detail of the employee whose name contains double a.

(ii) Select the details of the employee who work either for department HR or Admin.

(iii) Select the department name assigned to the employee whose employee id is 103.

(iv) Select the name of the employee who is working in the department with 'Abhishek' as manager.

(v) How many employees take salary more than 5000.

4. (a) Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Two cars will participate in one accident and we store damage amount for each accident. Specify key attributes and all constraints on the relationships. (5)

(b) Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of functional dependencies $F = \{\{A, B\} \rightarrow \{C\}, \{A\} \rightarrow \{D,E\}, \{B\} \rightarrow \{F\}, \{F\} \rightarrow \{G, H\}, \{D\} \rightarrow \{I,J\}\}$. What is the key for F? Decompose R into 2NF and then 3NF relations. (5)

6. (a) Consider the following relation– (6)

STUDENT

Attributes	Datatype	Constraint
Roll_no	Number	Primary Key
Name	String of maximum 20 characters	Not Null
Address	String of maximum 30 characters	
Phone	Integer	Not Null
CourseId	String of maximum 10 characters	

Give SQL queries for the following :

(i) Create the table for the above relation.

(ii) Alter the size of the *Address* to 50 characters.

(iii) Remove *Phone* attribute from the table.

(iv) Make *CourseId* as foreign key in the relation. (Assume that another relation **COURSE**, with primary key as *CID*, already exists)

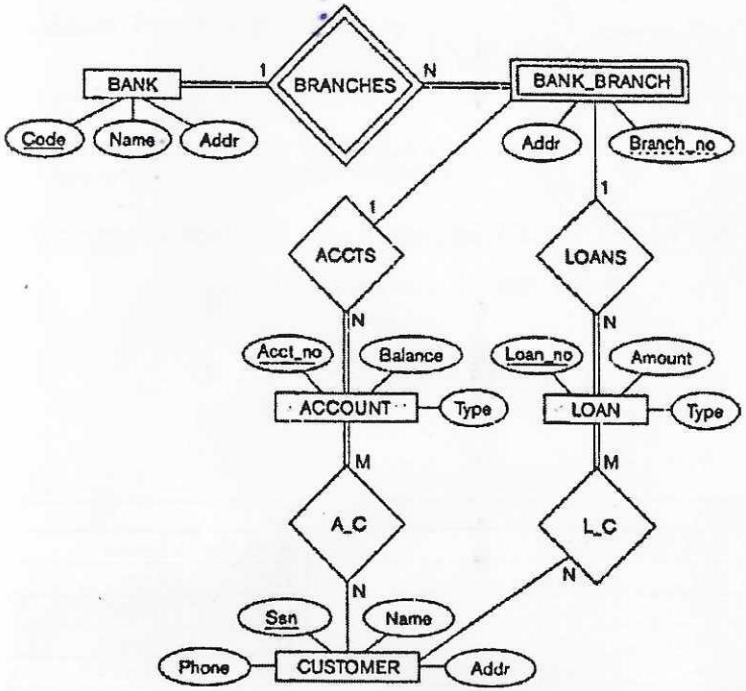
(b) What is Data independence? What is the difference between logical data independence and physical data independence? Explain with example. (4)

7. (a) Define degree, participation constraint and cardinality ratio of a relation with example. (3)

(b) Consider the ER diagram given below for a BANK database. Each bank can have multiple branches, and each branch can have multiple accounts and loans.

(i) List the weak entity type, its partial key, and identifying relationship. (2)

(ii) List the names of all relationships, and specify the (min, max) constraint on each participation of an entity type in a relationship type. (5)



8. (a) What is a Prime attribute? What undesirable dependencies are avoided when a 4 relation is in 3NF? Explain with example? (4)

(b) Show the results of the following operations on the two relation R1 and R2 6 given below : (6)

(i) R1 Union R2

(ii) R1 Intersect R2

(iii) R2 Minus R1

(iv) R1 join R2 (Join attribute is Roll No.)

(v) R1 left outer join R2 (Join attribute is Roll No.)

(vi) R1 Cartesian Product R2

R1:	
Roll_No	**Name**
101	Raman
102	Shyam
103	Gagan
104	Aarma
105	Riya

R2:	
Roll_No	**Name**
105	Riya
103	Gagan
102	Shyam
106	Saif
107	Rohan

question paper contains 8 printed pages.]

Your Roll No.....

No. of Question Paper : 6095 **E**

Paper Code : 32355202

of the Paper : Linear Algebra

of the Course : **Generic Elective – Mathematics [other than Maths (H)]**

ester : II

ation : 3 Hours Maximum Marks : 75

tructions for Candidates

Write your Roll No. on the top immediately on receipt of this question paper.

Attempt **all** questions by selecting any **two** parts from each question.

(a) If x and y are vectors in $\mathbb{R}^n$, then prove that

(i) $||x + y||^2 = ||x||^2 + ||y||^2$ if and only if $x.y = 0$.

P.T.O.

(ii) If $(x + y) . (x - y) = 0$, then $||x|| =$

(b) If $x = [4, 0, -3]$ and $y = [3, 1, -7]$ be two ve in $\mathbb{R}^3$, then decompose the vector y into component vectors in directions parallel orthogonal to the vector x.

(c) Define rank of a matrix. Also, find the rank of matrix

$$\begin{bmatrix} 3 & 1 & 0 & 1 & -9 \\ 0 & -2 & 12 & -8 & -6 \\ 2 & -3 & 22 & -14 & -17 \end{bmatrix}$$

2. (a) Solve the following system of linear equations us Gaussian Elimination method

$$3x_1 - 6x_2 + 3x_4 = 9$$

$$-2x_1 + 4x_2 + 2x_3 - x_4 = -11$$

$$4x_1 - 8x_2 + 6x_3 + 7x_4 = -5$$

(b) Examine whether the matrix $A = \begin{bmatrix} 7 & 1 & -1 \\ -11 & -3 & 2 \\ 18 & 2 & -4 \end{bmatrix}$

is diagonalizable. (6)

(c) Let V be a vector space, and let W_1 and W_2 be subspaces of V. Show that

(i) $W_1 \cap W_2$ is also a subspace of V.

(ii) $W_1 + W_2$ defined by $W_1 + W_2 = \{w_1 + w_2 : w_1 \in W_1, w_2 \in W_2\}$ is also a subspace of V. (6)

(a) Use the Simplified Span Method to find a simplified general form for all the vectors in span(S) where

$S = \left\{ \begin{bmatrix} -1 & 1 \\ 0 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ 1 & -1 \end{bmatrix}, \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix} \right\}$ is a subset of $\mathcal{M}_{22}$.

Is the set S linearly independent? Justify. (6½)

P.T.O.

(b) Define a basis for a vector space. Exa whether the set

$S = \{[3, 1, -1], [5, 2, -2], [2, 2, -1]\}$ forms a b for $\mathbb{R}^3$?

(c) Let $A = \begin{bmatrix} 1 & 1 & -2 \\ 2 & 1 & -3 \\ 5 & 4 & -3 \end{bmatrix}$. Using rank of A determ whether the homogeneous system $AX = 0$ ha non-trivial solution or not. If so, find the non-triv solution. (6

4. (a) Let $S = \{[1, 0], [1, -3]\}$ and $T = \{[1, -1], [1, 1]$ be two ordered bases for $\mathbb{R}^2$. Find the transitio matrix $P_{S \leftarrow T}$ from T-basis to S-basis. If v is in $\mathbb{R}$ and $[v]_T = [5,1]$, determine $[v]_S$. (6)

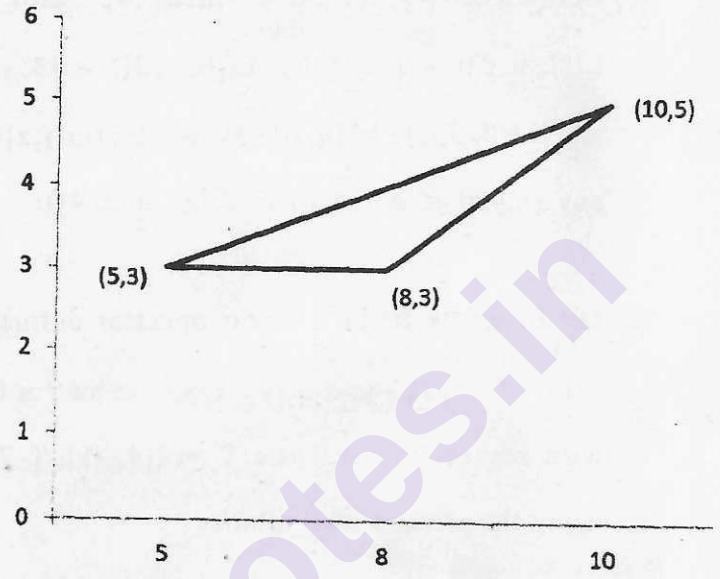
(b) Let $L: \mathbb{R}^3 \to \mathbb{R}^3$ be a linear operator and $L([1, 0, 0]) = [-2, 1, 0]$, $L([0, 1, 0]) = [3, -2, 1]$ and $L([0, 0, 1]) = [0, -1, 3]$. Find $L([x,y,z])$ for any $[x,y,z] \in \mathbb{R}^3$. Also find $L([-3, 2, 4])$. (6)

(c) Let $L: \mathbb{R}^2 \to \mathbb{R}^2$ be a linear operator defined by $L([x, y]) = [2x - y, x - 3y]$. Find the matrix for L with respect to the basis $T = \{[4, -1], [-7, 2]\}$ using the method of similarity. (6)

5. (a) For the graphic in the given figure, use ordinary coordinates in $\mathbb{R}^2$ to find new vertices after performing each indicated operation. Then sketch the figure that would result from this movement.

(i) Translation along the vector $[2, -1]$. (6½)

(ii) Reflection about the line $y = 2x$.



(b) State Dimension Theorem. Find a basis for Ker(L) and a basis for range(L) for the linear transformation L: $\mathbb{R}^3 \to \mathbb{R}^3$ given by (6½)

$$L\left(\begin{bmatrix} x \\ y \\ z \end{bmatrix}\right) = \begin{bmatrix} 5 & 1 & -1 \\ -3 & 0 & 1 \\ 1 & -1 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} \qquad \forall\, (x, y, z) \in \mathbb{R}^3$$

(c) Check whether the linear transformation L : $\mathcal{P}^3 \to \mathcal{P}^2$ defined by

$L(a x^3 + b x^2 + c x + d) = a x^2 + b x + c$

is an isomorphism or not. (6½)

6. (a) Find a least square solution for the following inconsistent system

$$\begin{pmatrix} 1 & -1 \\ 4 & 1 \\ 2 & 3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 0 \\ 4 \\ 5 \end{pmatrix}. \qquad (6)$$

(b) Let W = span{[8, −1, −4], [4, 4, 7]} and v = [1,2,3] $\in \mathbb{R}^3$. Find proj_w v, and decompose v into $w_1 + w_2$, where $w_1 \in W$ and $w_2 \in W^{\perp}$. (6)

(c) Let W be the subspace of $\mathbb{R}^3$, whose vectors lie in the plane $2x - 5y + z = 0$. Find a basis for W and its orthogonal complement. (6)

6114

27 MAY 2023

Unique Paper Code	: 32235907[redacted]
Name of the Paper	: **GE-7 Human Physiology**
Name of the Course	: **B.Sc. Theory Examination, May 2023**
Semester	: **Semester – II, CBCS**
Duration	: **3 hours**
Maximum Marks	: **75 Marks**

Instructions for candidates:

1. Write your ***Roll No.*** on the top immediately on receipt of this question paper
2. Attempt ***FIVE*** questions in all
3. Question ***No. 1*** is **compulsory**
4. **Draw** diagrams wherever required

Q1. (a) ***Define*** the following terms (Any ***five***): **5**

1. Tropic hormone
2. Latent period
3. Bohr's effect
4. Glial cells
5. Semilunar valves
6. Deglutition

(b) ***Distinguish*** between the following (Any ***five***): **10**

1. Spermatogenesis and spermiogenesis
2. I-band and A-band
3. Tubular reabsorption and tubular secretion
4. Systemic and pulmonary circulation
5. Chief cells and Parietal Cells
6. Neurotransmitter and Hormone

(c) ***Expand*** the following abbreviations: **4**

1. ANP
2. CCK
3. MMC
4. PRL

State the ***location*** and ***function*** of the following (Any ***four***): **8**

1. Acrosome
2. Tropomyosin
3. Type I Pneumocytes
4. Submucosal plexus
5. Thyrotrophs

Q2. (a) Discuss the various hormones of anterior pituitary and their effect on the target tissue. **8,4**

(b) Discuss the role of parathyroid gland in calcium homeostasis.

Q3. (a) Explain the excitation-contraction coupling with the help of suitable diagram. **8,4**

(b) What is an action potential.

Q4. (a) Describe the process of digestion and absorption of carbohydrate in the gastrointestinal tract. **9,3**

(b) Discuss the role of liver in food digestion.

Q5. (a) Discuss the various mechanisms of oxygen transport in blood. **8,4**

(b) Draw a well labelled diagram of Nephron.

Q6. (a) Discuss the various phases of cardiac cycle. **8,4**

(b) Explain the hormonal regulation of oogenesis.

Q7. Write short notes on ***Any Three*** of the following: **4x3=12**

a) Renin-Angiotensin-Aldosterone system
b) Sarcomere
c) Regulation of Glomerular filtration rate
d) Conduction system of heart

of digestion and absorption of carbohydrate in the food digestion. 9,3

inisms of oxygen transport in blood. 8,4
ram of Nephron.

; of cardiac cycle. 8,4
ılation of oogenesis.

of the following: 4x3=12
terone system

filtration rate
rt

[This question paper contains 4 printed pages.]

Your Roll No..............

E

Sr. No. of Question Paper : 6141

Unique Paper Code	:	32345402
Name of the Paper	:	Information Security and Cyber Laws
Name of the Course	:	**Computer Science : Generic Elective for Honours**
Semester	:	IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. **All** questions are compulsory from **Section A.**
3. Please attempt any **four** questions from **Section B.**
4. Part of a question must be answered together.

Section–A

1. (a) Briefly describe the term authentication. (2)

(b) What is the punishment for dishonestly receiving stolen computer resource or communication device under ITAA 2008? (2)

(c) Describe the need of information security. (2)

(d) Briefly explain the term cyber forensic. (2)

(e) Write a short note on email security. (2)

(f) Explain three security goals of a computer system. (3)

(g) What are the role and responsibility of cryptanalyst? (3)

(h) What is firewall? Explain what a firewall can and cannot do. (3)

(i) Differentiate symmetric key cryptography and asymmetric key cryptography with suitable examples. (3)

(j) Describe various categories of attacks with suitable examples. (3)

(k) Explain any three common security threats for operating system. (3)

(l) Describe the password selection criteria to select a strong password. (3)

(m) Briefly explain birthday attack and SQL injection attack. (4)

Section–B

2. (a) Explain various access control mechanisms in a computing system. (4)

(b) Encrypt the message "COME TO COMPUTER LAB AFTER CLASS" using Caesar cipher and rail fence cipher with key = 3. (6)

3. (a) Explain risk analysis. Describe the strategies to deal with the risk. (4)

(b) Briefly describe the following attacks with suitable examples :

(i) Denial of service attacks

(ii) Phishing

(iii) Malware attacks (6)

4. (a) Explain the CIA triad and its relevance to computer security. (5)

(b) Explain the section 66F and section72 of ITAA 2008. What are the punishments and penalties for the same? (5)

P.T.O.

5. (a) Describe security policy and its importance for an organization. Explain any three characteristics of a good security policy. (6)

(b) Describe any four digital India initiatives by the government of India. (4)

6. (a) Explain the Intrusion Detection System. Describe the various types of IDS. (6)

(b) Explain the concept of digital signature and digital certificate. (4)

7. (a) What do you mean by password crackers? (5)

(b) What are computer criminals? Describe cyber crime in detail. (5)

8. Differentiate between : (10)

(i) Virus and Trojan horse

(ii) Law and ethics

(iii) Fault and failure

(iv) Hacker and cracker

(v) Computer crime and digital crime

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6136 **E**

Unique Paper Code : 32175912

Name of the Paper : GE Molecules of Life

Name of the Course : **B.Sc. (Hons.)**

Semester : II / IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **six** questions in all.
3. **All** questions carry equal marks.

1. (a) Differentiate between fats and oil. Give the skeletal structure of a lipid which on hydrolysis yields glycerol, stearic acid and comment on its physical properties.

P.T.O.

(b) Write down the structure of glyceryl trioleate. Calculate its iodine number (Molecular weight of glyceryl trioleate: 884, atomic weight of iodine: 127). Write its significance.

(c) What are glycolipids. Discuss their biological significance and write down the structure of glycolipid derived from one molecule each of sphingosine, palmitic acid and β-D-glucose.

(4,4,4.5)

2. (a) Write the Merrifield synthesis of the dipeptide Phe-Val. Discuss the advantages of solid phase synthesis.

(b) What is denaturation of proteins? Explain with suitable examples.

(c) When a nonapeptide undergoes partial hydrolysis, it forms dipeptides, a tripeptide and two tetrapeptides whose amino acid compositions are shown. Reaction of the intact nonapeptide with Edman's reagent releases PTH-Leu. What is the sequence of the nonapeptide?

(i) Pro, Ser

(ii) Gly, Glu

(iii) Met, Ala, Leu

(iv) Gly, Ala

(v) Glu, Ser, Val, Pro

(vi) Glu, Pro, Gly, Pro

(vii) Met, Leu

(viii) His, Val (4,4,4.5)

P.T.O.

3. (a) Draw the structure of a fragment of DNA showing A-T and G-C pairing.

(b) What is the difference between nucleosides and nucleotides? Give the structure of Guanosine-5'-monophosphate.

(c) How do you differentiate between Transcription and Translation? (4,4,4.5)

4. (a) Differentiate between reversible and irreversible inhibition of enzyme activity.

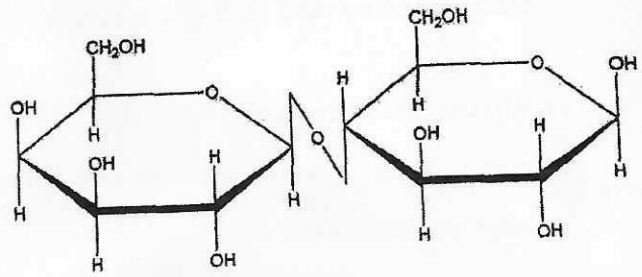
(b) Explain the binding role of the following in determining the structure activity relationship of a drug :

(i) –OH group

(ii) $-NH_2$ group

(c) Explain the effect of temperature and pH on the activity of enzymes. (4,4,4.5)

5. (a) Study the following structure and answer the questions below :



(i) Write the name of above sugar. Is it reducing or non-reducing sugar?

(ii) What is the name of the enzyme that would be required for someone to be able to digest above sugar?

(iii) If the glycosidic bond is hydrolyzed, what are the names of the monosaccharides (include the alpha or beta name) produced.

P.T.O.

(iv) Circle each anomeric carbon of the hydrolyzed products of above sugar.

(b) Draw Fischer and Haworth Projection of β-D-fructofuranose and β-D-glucopyranose.

(c) Write the reaction for the formation of glucosazone. Explain glucose and fructose gives same osazone derivative. (4,4,4.5)

6. (a) (i) Write the structure and biological importance of cholesterol.

(ii) Define calorific value of food. What is the standard calorific content of Proteins and Fats?

(b) Outline the steps involve in Citric acid cycle.

(c) What is fermentation? Discuss lactic acid and ethanol fermentation. (4,4,4.5)

7. Write short notes on **any three** of the following :–

(a) DNA Replication

(b) lock and key mechanism

(c) Glycolysis

(d) Amylose and Amylopectin (4,4,4.5)

8. (a) What do you understand by essential fatty acids? Give name and structure of any two essential fatty acids.

(b) Define isoelectric point. Calculate isoelectric point of arginine

Given *p*Ka (COOH) = 2.17, *p*Ka(NH_3^+) = 9.04, *p*Ka (side chain) = 12.48

(c) Why sucrose is known as an invert sugar? How do you account for the fact that sucrose does not reduce Fehling solution? Write Haworth projection formula for sucrose. (4,4,4.5)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6137 **E**

Unique Paper Code : 32175913

Name of the Paper : GE-Chemistry of s & p Block Elements, States of Matter and Chemical Kinetics

Name of the Course : **B.Sc. (Hons.) Chemistry**

Semester : II / IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **six** questions in all, **three** questions from each Section.
3. Use separate answer-sheets for **Section A** and **Section B** and do not intermix the sections.

P.T.O.

Section A

(Inorganic Chemistry)

Attempt any **three** *questions.*

Question No. **1** *is compulsory.*

1. Explain

(a) Pb(II) is more stable than Pb(IV). Why?

(b) Why Gallium is smaller in size as compared to Aluminium?

(c) Differentiate between mineral and ore.

(d) At room temperature Oxygen exist as a diatomic gas but sulphur exists as S_8 solid molecule.

(e) The chemical and physical properties of Li and Mg are similar.

(f) Diamond is hard but graphite is soft and slippery in nature.

(g) The chemical reactivity of noble gases is very low. (2,2,2,2,2,2,1.5)

2. (a) Arrange the following Boron trihalides in increasing order of their lewis acidity: BF_3, BCl_3, BBr_3

(b) "Orthoboric acid is a weak monobasic acid". Justify this statement. Can we titrate orthoboric acid using NaOH?

(c) Write down the two preparation methods of Borazine. Also discuss the difference in the chemical properties of Borazine and benzene.

(d) Write a short note on Mond's Process. (3,3,3,3)

3. (a) Arrange the following alkali metal ions in increasing order of their hydration radii:

Li^+, Na^+, K^+, Rb^+, Cs^+

(b) $SiCl_4$ reacts with water to produce SiO_2 but CCl_4 do not react with water. Explain.

(c) What are silicates? Discuss the different types of silicates with suitable examples.

(d) Draw the structure of P_4O_6 and P_4O_{10} molecules. Also discuss the formation of different products on hydrolysis of these phosphorus oxides.

(3,3,3,3)

4. (a) Discuss the difference in the geometry and basic nature of trisilylamine $N(SiH_3)_3$ and trimethylamine $N(CH_3)_3$.

(b) Draw the structure of following oxyacids of sulphur and also find out the number of S-S bonds in the structure of molecules :

H_2SO_5, $H_2S_2O_8$, $H_2S_2O_6$

(c) Arrange the following oxoacids of halogens in their increasing order of acidic behaviour and explain:

$HClO$, $HClO_2$, $HClO_3$, $HClO_4$

(d) Discuss the difference in the geometry of XeF_4 and XeO_2F_2. (3,3,3,3)

Section B

(Physical Chemistry)

Attempt any **three** *questions.*

5. (a) Derive the relations :

$$P_c = a/27b^2 \qquad T_c = 8a/27Rb$$

(b) Explain the factors which led van der Waals to modify the ideal gas equation $pV = nRT$ and hence derive the van der Waals equation of state.

(c) Calculate the most probable speed, average speed and root mean square speed of O_2 at 300 K. (4,4,4.5)

P.T.O.

6. (a) Define coefficient of viscosity. What are its SI units. Describe Ostwald's method for the determination of viscosity of a liquid.

(b) In a surface tension experiment using a Stalagmometer, equal volumes of two liquids A and B give 55 and 25 drops respectively. Their densities are 0.80 and 0.99 g cm^{-3} respectively. Determine the surface tension of liquid A if the surface tension of liquid B is 72.6 dynes cm^{-1}.

(c) The viscosity of gas increases with temperature while that of liquid decreases with temperature. Explain.

(d) What is Boyle temperature? (4,4,2.5,2)

7. (a) When a certain crystal was studied by the Bragg technique using X-rays of wavelength 229 pm, an X-ray reflection was observed at an angle of 23°20'.

(i) What is the corresponding interplanar spacing?

(ii) When another X-ray source was used, a reflection was observed at 15° 26'. What was the wavelength of these X-rays?

(b) Describe all the symmetry elements of a cube.

(c) Write short notes on any **two** of the following :

(i) Law of constancy of interfacial angles

(ii) Unit cell and space lattice

(iii) Axis of symmetry (4.5,4,4)

8. (a) Derive the integrated rate law equation for a second order reaction when the initial concentrations of both the reactants are same.

(b) Show that for a first order reaction the time required for 99.9% completion of the reaction is 10 times that required for 50% completion. Also derive the expression for $t_{1/2}$.

P.T.O.

(c) Write short notes on any **two** of the following :

(i) Activated complex theory

(ii) Arrhenius equation

(iii) Role of catalyst on the rate of a reaction

(4.5,4,4)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6207 **I**

Unique Paper Code : 32355402

Name of the Paper : GE-4: Numerical Methods

Name of the Course : **CBCS / LOCF (Other than B.Sc. (H) Mathematics Hons.)**

Semester : IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **two** parts from each question.
3. Use of scientific calculator is allowed.

1. (a) Round-off the number 34.64867 correct up to three significant digits and then calculate absolute percentage error. (6)

P.T.O.

(b) Find the absolute, relative and percentage error if the approximate value is 2.7182 and the true value is 2.71828182. (6)

(c) Perform four iterations of the bisection method to find the approximate root of the equation $x^5 + 2x - 1 = 0$ in interval (0,1). (6)

2. (a) By using the Regula–Falsi method find the approximate root, correct up to two decimal places, of the equation $x^3 - 6x + 4 = 0$ in the interval (0,1). (6.5)

(b) By performing three iterations of the secant method find the approximate root of the equation $x^3 - 5 \sin x + 1 = 0$ in the interval (0,1). (6.5)

(c) Using the Newton-Raphson method find the approximate value of the cube root of 25. Perform three iterations of the method by taking initial approximation $x_0 = 2.8$. (6.5)

3. (a) Using Gauss elimination method solve the following system of linear equations : (6)

$$x + 4y - z = -5$$

$$x + y - 6z = -12$$

$$3x - y - z = 4.$$

(b) Show that $E - 1 = \frac{1}{2}\delta^2 + \delta\mu$. (Note: Symbols have their own meaning) (6)

(c) Find the Lagrange interpolating polynomial which fits into the given data and approximate the value of f(5.5).

x	5	6	9
f(x)	12	13	14

(6)

P.T.O.

4. (a) By using the initial solution (0,0,0), perform three iterations of the Gauss Seidel method for the following system of linear equations : (6.5)

$$10x + 2y + z = 9$$

$$2x + 20y - 2z = -44$$

$$-2x + 3y + 10z = 22.$$

(b) Obtain the piecewise linear interpolating polynomial for the function f(x) defined by the given data and by using it estimate the value of f(3).

x	1	2	4	8
f(x)	3	7	21	73

(6.5)

(c) Following table gives the amount of half yearly premium for policies maturing at different ages:

(6.5)

Age (in years)	45	50	55	60	65
Premium (in Rs.)	114.84	96.16	83.32	74.48	68.48

Make the difference table. Obtain the forward Gregory-Newton interpolating polynomial and estimate the premium for policy maturing at the age of 46.

5. (a) For the following data, find f'(2) and f''(2) by using forward difference formulae

$$f'(x_i) \approx \frac{f(x_i + h) - f(x_i)}{h} \quad \text{and}$$

$$f''(x_i) \approx \frac{f(x_i) - 2f(x_i + h) + f(x_i + 2h)}{h^2}$$

P.T.O.

x	0	1	2	3	4
$f(x)$	8	4	6	20	52

(6)

(b) For the function f(x) = ln x, approximate f′(2) by Richardson extrapolation using central difference formula $f'(x) \approx \frac{f(x+h)-f(x-h)}{2h}$ with h = 0.1 and h = 0.05. (6)

(c) Use the formula

$$f'(x_i) \approx \frac{3f(x_i)-4f(x_i-h)+f(x_i-2h)}{2h}$$

to approximate the derivative of f(x) = sin x at $x_i = \pi$, taking h = 1, 0.1, 0.01. (6)

6. (a) Approximate the value of $(\ln 2)^{\frac{1}{3}}$ from $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Trapezoidal rule and Simpson's $\frac{1}{3}$ rule. (6.5)

(b) Apply the Fleun method to approximate the solution of the initial value problem

$$\frac{dy}{dx} = \frac{1}{2}(1+x)y^2, \quad 0 \le x \le 1, \quad y(0) = 1,$$

by using 5 steps. (6.5)

(c) Given the initial value problem (IVP):

$$\frac{dy}{dx} = \frac{e^x}{y}, \quad y(0) = 1.$$

P.T.O.

Find y(0.5) and y(0.75) by using the modified Euler's method. Also find the absolute error at each step given, that the exact solution of the IVP is $y=\sqrt{2e^x-1}$. (6.5)

[This question paper contains 4 printed pages.]

Your Roll No..............

Sr. No. of Question Paper : 6214 E

Unique Paper Code : 32225415

Name of the Paper : Thermal Physics and Statistical Mechanics

Name of the Course : B.Sc. Hons.-(Physics)_GE Paper

Semester : IV

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **five** questions in all, including Question No. **1** which is compulsory.
3. **All** question carry equal marks.
4. Symbols have their usual meaning.
5. Given value of Boltzmann Constant $(k_B) = 1.38\times10^{-23}$ $m^2kgs^{-2}K^{-1}$).

P.T.O.

1. Answer any **five** of the following : (3×5=15)

(a) Two moles of a perfect monoatomic gas, initially kept in a cylinder at STP, are made to expand until its volume is doubled. Show the process on a P-V diagram if it is carried out (i) adiabatically, (ii) isobarically, (iii) isothermally.

(b) Two ideal gases at initial pressure P_1 and volume V_1 are made to expand adiabatically to a final volume equal to four times the original volume. If the values of γ for these gases are 1.67 and 1.40, respectively, compare their final pressures.

(c) A reversible heat engine converts one sixth of the heat input into work. When the temperature of the sink is reduced by 62°C, its efficiency is doubled. Calculate the temperatures of the source as well as the sink.

(d) Establish the expression for work done during an adiabatic process.

(e) Name the three transport phenomena in a gas. What role is played by molecular collisions in these phenomena?

(f) Show that the ratio of the adiabatic and isothermal elasticities for any substance is equal to the ratio of their specific heats at constant pressure and volume.

(g) Define the terms microstate and macrostate of a thermodynamic system.

2. (a) Explain reversible, irreversible and quasistatic processes with the help of examples. (6)

(b) On the basis of the first law of thermodynamics, establish the expression for $C_P - C_V$ for a perfect gas. (5)

(c) The temperature of 5 g of air is raised by 1°C at constant volume. Calculate the increase in its internal energy in Joules. (Given C_V = 0.172 cal g^{-1} $°C^{-1}$ and 1 cal = 4.18 J) (4)

3. (a) Explain Carnot's cycle with the help of a diagram. Derive the expression for the efficiency of a Carnot engine. (10)

(b) Calculate the change in entropy when 1 kg water at 27°C is converted into superheated steam at 200°C under constant atmospheric pressure. Specific heat capacity of liquid water is 4180 J/kg/K; temperature dependence of specific heat capacity of steam is given by the relation (1670 + 0.49 T) J/kg/K at T Kelvin. Take latent heat of steam as 23×10^5 J/kg. (5)

4. (a) State the law of equipartition of energy and apply it to derive the specific heat of monoatomic, diatomic and linear triatomic gases. (8)

P.T.O.

(b) Derive the expression for the coefficient of viscosity on the basis of kinetic theory of gases. What are the factors on which viscosity depends? (5,2)

5. (a) Explain the distribution of energy of a black body at different temperatures by drawing the graphs. Discuss the laws which explain the energy spectrum. (5,5)

(b) Two large closely spaced concentric black body spheres are maintained at temperatures of 400K and 600K respectively. The space between the two spheres is evacuated. Calculate the net rate of energy transfer between the two spheres. (5)

6. Describe the Joule-Thomson porous-plug experiment and discuss the results. Hence obtain the expression for Joule-Thomson coefficient. What is temperature of inversion? (7,5,3)

7. (a) Derive an expression for thermodynamic probability and the most probable distribution function for a system obeying Bose-Einstein statistics. (10)

(b) Derive the expression $S = k_B \log W$ where symbols have their usual meanings. (5)