Hall Ticket Number :										

R-20

Code: 20AC13T

I B.Tech. I Semester Supplementary Examinations June 2024

Chemistry

(Common to CSE, CSE(AI), CSE(DS) and AI&DS)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

1. Answer ***all*** the following short answer questions (5 X 2 = 10M)	CO	BL
a) What is a polymer membrane electrode? Give any two examples.	CO1	L1
b) Identify and write the key components of a battery.	CO2	L4
c) Differentiate between chain growth and step-growth polymerization.	CO3	L2
d) State Beer-Lambert's Law.	CO4	L2
e) Name the types of motions exhibited by rotaxanes.	CO5	L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT-I			
2.	Define an electrochemical cell. Discuss the origin of electrode potential in electrochemical cells.	12M	CO1	L1
	OR			
3.	Classify ion-selective electrodes based on their types (glass membrane, polymer membrane, solid-state, gas-sensing).	12M	CO1	L4
	UNIT-II			
4.	Describe the diverse applications of batteries in everyday life and various industries.	12M	CO2	L2
	OR			
5.	Outline the main features of zinc-air batteries and lithium cells (Li- MnO_2), emphasizing their unique characteristics.	12M	CO2	L4
	UNIT-III			
6.	Assess the steps involved in the preparation of Bakelite and Nylon-6,6.	12M	CO3	L5
	OR			
7.	Explain how the unique properties of conducting polymers make them suitable for specific applications in electronics, sensors, and other fields.	12M	CO3	L2
	UNIT-IV			
8.	Explain the principles behind pHmetry, including the functioning of a glass electrode. Discuss any five applications of pHmetry.	12M	CO4	L1
	OR			
9.	Describe the various regions of the electromagnetic spectrum. Provide examples of applications for each region.	12M	CO4	L2
	UNIT-V			
10.	Given a specific set of environmental conditions, predict the behaviour of a molecular elevator and explain the key components and their functions.	12M	CO5	L3
	OR			
11.	What are molecular switches? Write about cyclodextrin-based switches.	12M	CO5	L1

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC15T

I B.Tech. I Semester Supplementary Examinations June 2024

Communicative English

(Common to CE, ME, CSE, AI&DS, CSE(AI) and CSE(DS))

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	What are the two things the author does not like about his son's reaction to his new school?	CO1	L2
b)	What is the refrain from the poem, "The Brook"?	CO2	L2
c)	How has the prince been trapped in "The Death Trap"?	CO1	L2
d)	What is the name of the bank that Muhammad Yunus founded? When was it established?	CO1	L2
e)	Which issues did Mrinalini Sarabhai focused in her dance practice?	CO1	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT-I			
2.	What is the author's attitude towards how one should behave with other people? Do you agree with his reasoning? Give reasons for your answer.	12M	CO1	L2
	OR			
3.	Write in detail about Skimming and Scanning skills and their uses in reading.	12M	CO5	L2
	UNIT-II			
4.	How has the poet described landscape, flowers, plants and colors in the poem? How does it make you feel as a reader? Substantiate your answer with examples from the poem?	12M	CO2	L2
	OR			
5.	**Complete the following sentences with the appropriate Preposition:**			
	i) She's interested _____ history.			
	ii) The keys are _____ the pillow.			
	iii) He's afraid _____ heights.			
	iv) The hotel is located _____ the beach.			
	v) I'm thinking _____ going to the gym later.			
	vi) The ball went _____ the fence.			
	vii) The cat slept _____ the bed.			
	viii) The bird flew _____ the window.			
	ix) The rabbit hopped _____ the hole.			
	x) The car drove _____ the corner.			
	xi) Dr Siddique is the person I spoke _____			
	xii) Raghu is fond _____ reading.	12M	CO4	L3

UNIT-III

6. How does Dimitri defend himself from the death trap? 12M CO1 L2

OR

7. **Rewrite the sentences as directed:**
   i) He said to her "What are you doing?" (Indirect Speech)
   ii) She says, "I am ready." (Indirect Speech)
   iii) The manager said to the attendant, "Close the door". (Indirect Speech)
   iv) Ramu said "I was reading Ramayana last night". (Indirect Speech)
   v) She asked me if I had finished dinner. (Direct Speech)
   vi) He said, "I wrote a letter". (Indirect Speech)

   Fill in the blanks by using appropriate tense form by using the directions given in brackets:
   i) Both the rice and curd _____ fresh and tasty. (be: Simple Present)
   ii) The planes ____ the airport. (approach: Present Perfect Continuous)
   iii) Either the boys or their parents _____ have report cards. (collect: Present Perfect)
   iv) It _____ since yesterday. (rain: Present Perfect Continuous)
   v) Rs.10,000 a month _____ a good salary for a beginner. (be: Simple Present)
   vi) He _____ here since 2011. (work: has been/ have been) 12M CO4 L4

UNIT-IV

8. Describe and discuss Mohammad Yunus' contribution for the upliftment of the economic status of the poor people. 12M CO2 L4

OR

9. **a) Choose the appropriate adjective given in brackets:**
   i) Janaki is as _____ (tall/taller) as his sister.
   ii) Alexander was one of _____(the greatest/great) king who ever lived.
   iii) Chennai is _____ (hot/hotter) than Mumbai.
   iv) This temple is _____ (the biggest/bigger) in South India.
   v) Sindhu is _____(cleverer/ more cleverer) than Sara.
   vi) Ravi is_____(stron/the strongest) boy in his class.

   b) Re write the sentences as directed:
   i) He said, "I wrote a letter". (Indirect Speech)
   ii) She says, "I am ready". (Indirect Speech)
   iii) They said to the teacher, "Let us go home". (Indirect Speech)
   iv) Raghu said that he had been writing letters. (Direct Speech)
   v) She asked Meena where she had gone. (Direct Speech).
   vi) Sravan said to me, "What are you doing?" (Indirect Speech) 12M CO4 L3

UNIT-V

10. What inspires and motivates you through the story of Mrinalini in Ranjana Dev's "The Dancer with a White Parasol"? 12M CO1 L2

OR

11. Imagine yourself as the Librarian of AITS, Rajampet. Write a letter to the XYZ Publishers, Hyderabad, placing an order for the required books of Engineering for your college library. 12M CO5 L4

*** End ***

Hall Ticket Number :										

R-20

Code: 20A511T

I B.Tech. I Semester Supplementary Examinations June 2024

Problem Solving through C Programming

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	List the various steps that are involved in solving a problem	CO1	L1
b)	What are selection statements?	CO2	L1
c)	What is the difference between strlen() and sizeof the string?	CO3	L1
d)	What is pointer and how to declare and initialize pointer.	CO4	L1
e)	How do we identify the end of file in C. Illustrate with an example?	CO5	L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT-I			
2. a)	Briefly explain about the basic data types that C language supports.	6M	CO1	L2
b)	What is flow chart? How it is useful in writing the programs? Explain about different symbols in flow chart	6M	CO1	L2
	OR			
3. a)	Illustrate the Relational Operators and Logical operators in C.	6M	CO1	L3
b)	Explain the operator precedence and Associativity with examples in C.	6M	CO1	L2
	UNIT-II			
4. a)	In what way a do...while is different from while looping statement. Explain.	6M	CO2	L2
b)	Write a C program to find the factorial of a number using while loop.	6M	CO2	L3
	OR			
5. a)	Sort the following list of elements using bubble sorting technique. -2,45,0,11,-9	6M	CO2	L4
b)	Briefly explain Binary Search algorithm.	6M	CO2	L2

UNIT-III

6.	a)	Write a C program to count the number of vowels and consonants, digits spaces and special characters in a line of string.	6M	CO3	L3
	b)	Illustrate the concept of Towers of Hanoi Problem. How recursion helps to solve this problem.	6M	CO3	L3

OR

7.	a)	Discuss the preprocessor directives.	6M	CO3	L2
	b)	Write a C program to find the LCM of two integers.	6M	CO3	L3

UNIT-IV

8.	a)	What is pointer arithmetic? Illustrate with an example	6M	CO4	L3
	b)	Write a c program to swap two integer variables using swap function.	6M	CO4	L3

OR

9.		Explain in detail about Dynamic Memory Allocation functions with an examples in C programming.	12M	CO4	L2

UNIT-V

10.	a)	How to represent union in Structure? Explain with an example.	6M	CO5	L2
	b)	Illustrate file positioning functions in C with example.	6M	CO5	L3

OR

11.	a)	What are self-referential structures? Explain them with an example	6M	CO5	L2
	b)	Write a program to copy one file data into another file.	6M	CO5	L3

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC11T

I B.Tech. I Semester Supplementary Examinations June 2024

Algebra and Calculus

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

1. Answer ***all*** the following short answer questions (5 X 2 = 10M) CO BL

a) If $A=\begin{bmatrix}1 & 4 & 5\\ 0 & 6 & 8\\ 0 & 0 & 22\end{bmatrix}$ then find the rank of A — CO1 L1

b) State Cayley-Hamilton theorem. — CO2 L2

c) Obtain Maclaurin's series for $f(x) = \sin x$ — CO3 L3

d) Write the area enclosed by a plane curve in xy-plane — CO4 L2

e) Define Beta function — CO5 L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

Marks CO BL

UNIT-I

2. Reduce the following matrix into its normal form and hence find its rank.

$$\begin{bmatrix}2 & 3 & -1 & -1\\ 1 & -1 & -2 & -4\\ 3 & 1 & 3 & -2\\ 6 & 3 & 0 & -7\end{bmatrix}$$

12M CO1 L1

OR

3. a) Show that a square matrix A and A^T have the same Eigen values — 6M CO1 L2

b) If a is Eigen value of an Orthogonal matrix, then show that is also its Eigen value. — 6M CO1 L2

UNIT-II

4. Reduce the quadratic form $2x_1x_2 + 2x_1x_3 - 2x_3x_2$ to canonical form by an orthogonal reduction and discuss its Nature. Also find the model matrix. — 12M CO2 L3

OR

5. Show that the matrix $\begin{bmatrix} 1 & -2 & 2 \\ 1 & -2 & 3 \\ 0 & -1 & 2 \end{bmatrix}$ satisfies its characteristic equation. Hence find A^{-1}. 12M CO2 L2

UNIT-III

6. a) Expand the Taylor's series expansion of $sin\, x$ in powers of $\left(x - \frac{\pi}{2}\right)$ 6M CO3 L3

b) If $U = f(2x - 3y, 3y - 4z, 4z - 2x)$ then find the value of $\frac{1}{2}\frac{\partial U}{\partial x} + \frac{1}{3}\frac{\partial U}{\partial y} + \frac{1}{3}\frac{\partial U}{\partial z}$ 6M CO3 L3

OR

7. A rectangular box open at the top is to have volume of 32 cubic ft. find the dimensions of the box requiring least material for its construction. 12M CO3 L3

UNIT-IV

8. Evaluate the double integral $\iint_R xydxdy$ where 'R' is the region bounded by the lines $x - axis$, the line $y = 2x$ and $y = \frac{x}{4a}$ 12M CO4 L5

OR

9. Evaluate the integral by changing the order of integration $\int_0^a \int_{\frac{x^2}{a}}^{2a-x} xy^2 dydx$ 12M CO4 L5

UNIT-V

10. a) Show that $\int_0^1 x^m (log\, x)^n\, dx = \frac{(-1)^n n!}{(m+1)^{n+1}}$ where n is a positive integer and m>-1 6M CO5 L2

b) Evaluate $\int_0^{\frac{\pi}{2}} sin^{10}\theta\ d\theta$ 6M CO5 L5

OR

11. Express the following integrals in terms of gamma function

$(i)\ \int_0^1 \left(\frac{1}{\sqrt{1-x^4}}\right) dx \qquad (ii) \int_0^{\frac{\pi}{2}} \sqrt{tan\,\theta}\, d\theta$ 12M CO5 L2

*** End ***