

Hall Ticket Number :									
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R-20

Code: 20AC13T

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

Chemistry

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

Max. Marks: 70

Time: 3 Hours

- 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) Define electrode potential. | CO1 | L1 |
| b) Differentiate between primary and secondary batteries. | CO2 | L2 |
| c) What is a polymer, and provide an example of a common synthetic polymer. | CO3 | L1 |
| d) What is chromatography? Explain their types. | CO4 | L1 |
| e) What is a molecular motor? | CO5 | L2 |

PART-B

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

Marks CO BL

UNIT-I

- | | | | |
|---|-----|-----|----|
| 2. Derive the Nernst equation for a single electrode. Write any four applications of the Nernst equation. | 12M | CO1 | L3 |
|---|-----|-----|----|

OR

- | | | | |
|---|----|-----|----|
| 3. a) Distinguish between a galvanic cell and an electrolytic cell. | 6M | CO1 | L4 |
| b) State the sign convention for electrode potentials. | 6M | CO1 | L1 |

UNIT-II

- | | | | |
|---|-----|-----|----|
| 4. List the key components of a Leclanche cell and describe their functions in the overall operation of the cell. | 12M | CO2 | L1 |
|---|-----|-----|----|

OR

- | | | | |
|--|-----|-----|----|
| 5. Describe the operation of a hydrogen and oxygen fuel cell, including its properties and applications. | 12M | CO2 | L1 |
|--|-----|-----|----|

UNIT-III

- | | | | |
|--|----|-----|----|
| 6. a) List the factors that determine the functionality of monomers. | 6M | CO3 | L1 |
| b) Define each type of polymerization with examples. | 6M | CO3 | L1 |

OR

- | | | | |
|--|-----|-----|----|
| 7. Explain the mechanisms of cationic and anionic addition polymerization. | 12M | CO3 | L2 |
|--|-----|-----|----|

UNIT-IV

8. Summarize Beer-Lambert's Law and its significance in quantitative analysis. 12M CO4 L5

OR

9. Explain the principle of separation in TLC, including the interaction between the stationary phase and the mobile phase. Write five applications. 12M CO4 L2

UNIT-V

10. Propose a system based on catenanes for a specific application, considering its structural features. 12M CO5 L3

OR

11. Explain the effect of light and the pH effect of a molecular switch with an example. 12M CO5 L2

*** End ***

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R-20

Code: 20AC15T

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

Communicative English

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

Max. Marks: 70

Time: 3 Hours

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 emotions did Hazlitt's son express when he was moved to a new school? | CO1 | L2 |
| b) What is the poem "The Brook" about? | CO2 | L2 |
| c) At what age the prince 'Dimitri' came into the throne of 'Kedaria'? | CO1 | L2 |
| d) When was Mohammad Yunus awarded 'Nobel Peace Prize'? | CO1 | L2 |
| e) What is the name of the training academy established by Mrinalini Sarabhai? | | L1 |
| | CO2 | |

PART-B

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

Marks CO BL

UNIT-I

2. What does the author say about despising people? What justification does he provide for his advice? 12M CO1 L2

OR

3. a) **Change the following statements into questions:**

i) My grandparents live with my uncle.

ii) He had a strange experience yesterday.

iii) Her mother has bought a nice gift for her.

iv) Jack has bought an interesting book from the library.

v) They have accepted the invitation.

vi) My neighbor is a kind-hearted lady.

6M CO3 L4

- b) **Identify the Parts of Speech of the underlined words in the following sentences:**

i) The car moved slowly around the track.

ii) He walked through the park.

iii) They waited anxiously for the game to begin.

6M CO3 L4

UNIT-II

4. How has the poet drawn parallelism between the journey of the brook and the life of man? 12M CO2 L2

OR

5. Fill in the blanks with the appropriate article or no article:

- i) This is ____ interesting book.
- ii) My father is ____ police office.
- iii) She picked me at ____ airport.
- iv) Experts say that ____ coffee is good for health.
- v) They are having ____ party next week.
- vi) He is wearing ____ black suit to the wedding.
- vii) I am looking for ____ job in marketing.
- viii) He climbed ____ Mount Everest.
- ix) The doctor prescribed ____ medicine for my headache.
- x) We bought some cheese and jam. ____ cheese was delicious.
- xi) Our library has three copies of ____ Mahabharata.
- xii) This is ____ great service to humanity.

12M CO4 L3

UNIT-III

6. How does Dimitri escape himself from the death trap?

12M CO1 L3

OR

7. Write a detailed note on Summarizing Skills.

12M CO5 L4

UNIT-IV

8. Why did Mohammed Yunus establish Grameen Bank and how it helped the rural women in Bangladesh?

12M CO2 L1

OR

9. Develop the following hints into a meaningful passage.

Without hard work - no knowledge - all things – difficult initially – climbing mountains –get arduous training live in camps – minimum food – more hardships – risking life – lesson – no achievement without self –sacrifice – adequate – preparation – high achievers – overcome more difficulties.

12M CO5 L4

UNIT-V

10. Narrate the inspiring story of Mrinalini Sarabhai and describe the left by her for future generation.

12M CO4 L3

OR

11. Write a letter to the District Magistrate, drawing his attention to the nuisance of loud speakers in your locality.

12M CO5 L4

*** End ***

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R-20

Code: 20A511T

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

Problem Solving through C Programming

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

- 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 the size of integer data type? | CO1 | L1 |
| b) Differentiate do-while and while statements. | CO2 | L2 |
| c) List the various storage classes in C. | CO3 | L1 |
| d) What is a void pointer? | CO4 | L1 |
| e) Give various modes of opening a file. | 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) What are the various steps to solve a problem?
Explain them by taking an example. | 6M | CO1 | L1,L2 |
| b) Draw a flow chart to find the largest of three numbers in C. | 6M | CO1 | L3 |

OR

- | | | | |
|---|----|-----|-------|
| 3. a) Explain the Structure of C program. | 6M | CO1 | L2,L3 |
| b) How many keywords does C Language support?
Explain. | 6M | CO1 | L1,L2 |

UNIT-II

- | | | | |
|---|----|-----|-------|
| 4. a) Explain Nested if else statements with an example. | 6M | CO2 | L2 |
| b) Write a C program to find the smallest number among three numbers. | 6M | CO2 | L1,L3 |

OR

- | | | | |
|---|----|-----|-------|
| 5. a) Describe about two dimensional arrays, initializing the two dimensional arrays and accessing elements in such arrays. | 6M | CO2 | L2 |
| b) Write a program to find an element present in a given array by using any one search technique. | 6M | CO2 | L1,L3 |

UNIT-III

6. Explain briefly about string handling functions in C with examples. 12M CO3 L2

OR

7. a) Differentiate call by value and call by reference with example 6M CO3 L1,L3
 b) Illustrate the concept of recursion. 6M CO3 L2

UNIT-IV

8. a) Define a pointer. How to initialize and declare pointer variables? Explain the same with examples 6M CO4 L1,L2
 b) Explain how to pass one dimensional arrays to functions 6M CO4 L2

OR

9. a) Write advantages and disadvantages of pointers 6M CO4 L1,L3
 b) Write a C program to find the greatest and smallest element in an array using pointers. 6M CO4 L1,L3

UNIT-V

10. a) Differentiate between structures and unions, and write the syntax for nested structures 6M CO5 L1,L2
 b) What is an enumerated data type? Explain with example. 6M CO5 L1,L2

OR

11. a) Explain the syntax for Nested structures. Describe Nested structures with an example. 6M CO5 L2
 b) Write a C program to reverse the contents of a file 6M CO5 L1,L2

*** End ***

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R-20

Code: 20AC11T

I B.Tech. I Semester Supplementary Examinations Dec 2023 / Jan 2024

Algebra and Calculus
(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

- 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) Define the rank of the Matrix | CO1 | L1 |
| b) Define index and signature of a Quadratic form | CO2 | L1 |
| c) Define the rank of the Matrix and signature of a Quadratic form. If $x = r \cos \theta, y = r \sin \theta$ then find $\frac{\partial(x,y)}{\partial(r,\theta)}$ | CO3 | L3 |
| d) Evaluate $\int_0^{\pi/2} \int_0^2 \int_0^2 xy^2z \, dz \, dy \, dx$ | CO4 | L5 |
| e) Define Gamma 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. a) Reduce the matrix to Echelon form and find its rank | | |
| $\begin{bmatrix} -1 & -3 & 3 & -1 \\ 1 & 1 & -1 & 0 \\ 2 & -5 & 2 & -3 \\ -1 & 1 & 0 & 1 \end{bmatrix}$ | 6M | CO1 L3 |
| b) Investigate the values of λ and μ so that the equations $2x+3y+5z=9, 7x+3y-2z=\mu$ have (i) no solution, (ii) a unique solution and (iii) an infinite number of solutions. | 6M | CO1 L3 |

OR

- | | | |
|---|-----|-----------|
| 3. Find for what value of λ the system of equations $x+y+z=1, x+2y+4z=\lambda, 4y+10z=\lambda$ has a solution and solve them completely in each case. | | |
| | 12M | CO1 L3 |

UNIT-II

- | | | |
|--|-----|-----------|
| 4. State and verify Cayley-Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ and hence find A^4 . | | |
| | 12M | CO2 L2 |

OR

5. If $A = \begin{bmatrix} 4 & -8 & -2 \\ 1 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ then find the matrix P (model matrix) which transforms the matrix A to a Diagonal matrix. 12M CO2 L3

UNIT-III

6. a) Using Maclaurin's series, expand $\log(1+x)$ in powers of x. 6M CO3 L3
 b) Using Maclaurin's series, find the minimum value of $x^2 + y^2 + z^2$ given $x + y + z = 3a$. 6M CO3 L3

OR

7. a) If $x + y + z = a$, $x + y + z = u$, $y + z = uv$, $z = uvw$, then evaluate $\frac{\partial(x,y,z)}{\partial(u,v,w)}$. 6M CO3 L5
 b) Find the maximum value of $x^2 + y^2 + z^2$ under the condition that $x + y + z = a$. 6M CO3 L3

UNIT-IV

8. Evaluate the integral $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} y \, dy \, dx$. 12M CO4 L5

OR

9. Evaluate $\int_0^1 \int_0^{1-x} \int_0^{1-x-y} e^{x+y+z} \, dz \, dy \, dx$. 12M CO4 L5

UNIT-V

10. a) Show that $\Gamma\left(\frac{1}{2}\right) = \sqrt{\pi}$. 6M CO5 L2
 b) Evaluate $\int_0^1 x^{\frac{3}{2}} (1-x^2)^{\frac{5}{2}} \, dx$. 6M CO5 L5

OR

11. a) State and prove relation between Beta and Gamma functions. 6M CO5 L2
 b) Evaluate $\int_0^1 \frac{x^2}{\sqrt{1-x^5}} \, dx$ in terms of beta function. 6M CO5 L5

*** End ***