

Hall Ticket Number :

R-19

Code: 19AC14T

I B.Tech. I Semester Supplementary Examinations November 2023

Engineering Chemistry

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks CO BL

UNIT-I

1. a) Discuss the construction and working of calomel electrode? 7M CO1 L3
 b) Write a short note on glass membrane electrode. 7M CO1 L1

OR

2. a) Explain about
 i. polymer membrane electrode. ii. gas sensing electrode . 7M CO1 L1
 b) Calculate the emf of the given concentration cell at 298k.
 $\text{Ag(s)}/\text{AgNO}_3\{0.018\text{M}\}/\text{AgNO}_3\{1.2\text{M}\}/\text{Ag(s)}$. 7M CO1 L3

UNIT-II

3. a) Describe the working principle construction and chemistry Zn-air of battery. 10M CO2 L2
 b) What are the advantages and disadvantages of $\text{H}_2\text{-O}_2$ fuel cell? 4M CO2 L1

OR

4. a) Classify different types of batteries. 7M CO2 L4
 b) What is working principle of secondary battery? Give one example 7M CO2 L1

UNIT-III

5. a) What do you mean by non-conventional source of energy? Give examples. 7M CO3 L1
 b) Apply the photo voltaic effect in manufacturing of solar cell? 7M CO3 L3

OR

6. a) How do you get the n-type silicon semiconductor for pv cells 7M CO3 L1
 b) Discuss production of solar grade silicon from quartz by float zone method. 7M CO3 L3

UNIT-IV

7. a) What are the plastics? Distinguish between thermoplastics and thermosetting plastics. 7M CO4 L4
 b) Explain synthesis and applications of nylon 6, 6. 7M CO4 L2

OR

8. a) What is Ziegler natta catalyst? Explain stereospecific polymerization with examples. 8M CO4 L2
 b) Explain about functionality and tacticity of polymer. 6M CO4 L2

UNIT-V

9. a) What are nanoparticles? Explain properties and applications of nanoparticles. 7M CO5 L2
 b) Explain briefly about molecular machines and molecular switches. 7M CO5 L2

OR

10. a) What are the rotaxanes? Discuss an acid base controlled molecular shuttle. 7M CO5 L3
 b) Write a notes on nano clusters and nano wires. 7M CO5 L1

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R-19

Code: 19A511T

I B.Tech. I Semester Supplementary Examinations November 2023

Problem Solving and C Programming

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks

UNIT-I

1. a) What is a variable? What are the rules for declaring variables? Give examples of valid and invalid variables 8M
- b) What is an algorithm? Describe the characteristics of an Algorithm 6M

OR

2. a) What is data type? Explain basic data types and their sizes used in a C Language 7M
- b) Draw the Flow Chart for finding a number is prime or not. 7M

UNIT-II

3. a) Write a C program to generate multiplication table 6M
- b) Explain in detail about Control Statements? 8M

OR

4. a) Write a program in C to search for an element using linear search technique 7M
- b) Explain about selection sort with suitable example. 7M

UNIT-III

5. a) Explain any five string manipulation library functions with examples. 9M
- b) What is mean by recursion? Explain the advantages of recursive function. 5M

OR

6. What is function parameter? Explain different types of parameters in C functions. 14M

UNIT-IV

7. What is dynamic memory allocation? Write and explain the different dynamic memory allocation functions in C. 14M

OR

8. a) What is a pointer? Explain how the pointer variable declared and initialized. 7M
- b) Write advantages and disadvantages of pointers 7M

UNIT-V

9. a) Explain how the structure variable passed as a parameter to a function with example. 7M
- b) Write a C program to read and display a text from the file. 7M

OR

10. a) What is a self-referential structure? Give an example. 5M
- b) What is a file? Explain how the file open and file close functions 9M

Important Note: 1. On completing your answers. Compulsorily draw diagonal cross line on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 32+8=40, will be treated as malpractice.

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R-19**Code: 19AC11T**

I B.Tech. I Semester Supplementary Examinations November 2023

Algebra and Calculus

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks CO BL

UNIT-I

1. a) If λ is an Eigen value of a non-singular matrix A , then $\frac{1}{\lambda}$ is an Eigen value

of A^{-1}

7M CO1 L2

- b) Find the Eigen values of $A = \begin{bmatrix} 1 & 2 & -1 \\ 0 & 2 & 2 \\ 0 & 0 & -2 \end{bmatrix}$

7M CO1 L3

OR

2. a) Find the rank of $A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 4 \\ 7 & 10 & 12 \end{bmatrix}$

7M CO1 L3

- b) Solve $x + y + z = 4, 2x + 5y - 2z = 3, x + 7y - 7z = 5$

7M CO1 L3

UNIT-II

3. Reduce the quadratic form $2x^2 + 2y^2 + 2z^2 - 2xy - 2yz + 2zx$ to canonical form by using orthogonal transformation.

14M CO2 L3

OR

4. Diagonalize the matrix $A = \begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$

14M CO2 L2

UNIT-III

5. a) If $z = u^2 + v^2$ and $u = at^2, v = 2at$, then find $\frac{dz}{dt}$

7M CO3 L3

- b) Evaluate $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$, if $z = \log(x^2 + y^2)$

7M CO3 L3

OR

6. Find the maximum and minimum values of $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$

14M CO3 L3

UNIT-IV

7. Trace the curve $r = a \cos 2\theta$

14M CO4 L4

OR

8. a) Expand $\sin x$ in powers of $(x - \frac{f}{2})$.

7M CO4 L3

- b) Using Maclaurin's series, expand $\log(1+x)$ in powers of x .

7M CO4 L3

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UNIT-V

9. Show that $\int_0^{\infty} x^4 e^{-x^2} dx = \frac{3\sqrt{f}}{8}$

14M CO5 L3

OR

10. a) Evaluate $\int_0^2 \int_0^3 xy dx dy$

7M CO5 L3

b) Evaluate $\int_0^2 \int_0^x y dy dx$

7M CO5 L3
