Hall Ticket Number :										

R-15

Code: 5GC22

I B.Tech. II Semester Supplementary Examinations November 2023

Engineering Chemistry

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

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

****

UNIT–I

1. a) What are boiler troubles? How are they caused? Give suggestions to minimize the troubles. 7M

   b) What is the principle of EDTA titration? Briefly describe the estimation of hardness of water by EDTA method. 7M

OR

2. a) With the help of neat diagram, describe the reverse osmosis method for the desalination of brackish water. 7M

   b) What is hardness of water? How do you classify and express hardness? 7M

UNIT–II

3. a) Explain the composition, working and applications of Ni-Cd cell 7M

   b) What is the principle underlying conductometric titration? Discuss the titration curve obtained for a titration between HCl and NaOH. 7M

OR

4. Explain the following
   (a) Nickel electrolessplating (b) Copper electroplating 14M

UNIT–III

5. Write a note on
   (a) Degree of polymerization. (b) Functionality. (c) Tacticity of polymer 14M

OR

6. a) Write a note on processing of raw rubber? Explain the draw backs of raw rubbers. 7M

   b) Explain Chain polymerization and Step growth polymerization with examples. 7M

UNIT–IV

7. a) Explain various steps involved in refining of petroleum 7M

   b) Describe how synthetic petrol is synthesized from Bergius process 7M

OR

8. What is the main raw material for the metallurgical coke? Describe the Otto Hoffmann's method of manufacture of metallurgical coke. How do you recover the byproducts in this method? 14M

UNIT–V

9. a) Write a note on the classification of refractories with examples. 7M

   b) What is the significance of flash & fire point, cloud & pour point of a good lubricant? 7M

OR

10. a) Explain the hardening and setting of cement using the chemical equations 7M

    b) Write a note on the composition of Portland cement 7M

***

Hall Ticket Number :										

R-15

Code: 5GC24

I B.Tech. II Semester Supplementary Examinations November 2023

Engineering Mathematics – II

(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)

****

UNIT–I

1. a) Show that the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is $\frac{16}{3}a^2$ 7M

   b) Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz\,dx\,dy\,dz$ 7M

OR

2. a) Change of order of integration and evaluate $\int_0^{\infty} \int_x^{\infty} \frac{e^{-y}}{y}\,dx\,dy$ 7M

   b) Evaluate $\int_0^1 \int_0^{1-z} \int_0^{1-x-y} (x+y+z)\,dx\,dy\,dz$ 7M

UNIT–II

3. a) Write the Laplace Transforms of some standard functions 6M

   b) Find the Laplace Transform of i) $\cos 2t$ ii) $\sin 2t \sin 3t$ 8M

OR

4. a) Using Convolution Theorem, Evaluate $L^{-1}\left\{\frac{s+2}{s^2-4s+13}\right\}$ 7M

   b) Find the Laplace Transform of $t\sin 3t$ 7M

UNIT–III

5. Solve the differential equation $\frac{d^2x}{dt^2} + 9x = \sin t$ given that $x(0) = 1, x\left(\frac{®}{2}\right) = 1$ using Laplace Transform 14M

OR

6. Solve $y'' + 2y' - 3y = \sin t,\ y(0) = 0,\ y'(0) = 0$ Using Laplace Transform 14M

UNIT–IV

7. a) Show that $\nabla^2\left(\frac{1}{r}\right) = 0$ 7M

   b) Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point $(2, -1, 2)$ 7M

OR

8. a) Evaluate the line integral of $\int_c (xy + y^2)\,dx + x^2\,dy$ where 'c' is the square formed by the lines $y = \pm 1$ and $x = \pm 1$ 7M

   b) Using the line integral, calculate the work done by the force, $\bar{F} = (3x^2 - 6yz)\bar{i} + (2y + 3xz)\bar{j} + (1 - 4xyz^2)\bar{k}$ in moving a particle from the point $(0,0,0)$ to the point $(1,1,1)$ along the curve $C: x = t,\ y = t^2,\ z = t^3$. 7M

UNIT–V

9. Verify by Green's Theorem for $\int_c \left[(xy + y^2)\,dx + x^2\,dy\right]$ where 'c' is bounded by $y = x$ and $y = x^2$ 14M

OR

10. Verify divergence theorem for $\bar{F} = 4xz\bar{i} - y^2\bar{j} + yz\bar{k}$ taken over the cube bounded by $x = 0, x = 1; y = 0,\ y = 1; z = 0, z = 1$ 14M

***

Hall Ticket Number :										

R-15

Code: 5G121

I B.Tech. II Semester Supplementary Examinations November 2023

C Programming and Data Structures

(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)

****

UNIT–I

1. a) Write a program to read and display array elements using pointers 7M

   b) What is a pointer? What are the features of pointers? Write a C program to print address of a variable 7M

OR

2. a) Write a C program to swap two numbers using pointers. 6M

   b) Write a program to perform addition of array elements using pointer to array. 8M

UNIT–II

3. a) Explain different modes to open a file 7M

   b) How to copy and compare structure variables? Illustrate with example. 7M

OR

4. a) Define union. List out the differences between unions and structures 7M

   b) Write a C program to copy the contents from one file to another file. 7M

UNIT–III

5. Write a C Program to perform the following operations on a queue
   a) Insert b) Delete c) Display 14M

OR

6. Show the stack after each operation of the following sequence that starts with the empty stack: push(a), push(b), pop, push(c), push(d), pop. 14M

UNIT–IV

7. What is a Doubly Linked List.? Explain different operations of a Doubly linked list with suitable examples. 14M

OR

8. Write a C program to implement the following operations on a singly Linked List
   a) Insert at beginning b) deletion at end c)Traversing a List 14M

UNIT–V

9. a) Define and describe the terms:
   Tree, Binary Tree, Complete Binary Tree and Degree of a tree. 9M

   b) Draw a complete undirected graph having five nodes. 5M

OR

10. Define Graph and describe various representations of a graph with suitable examples. 14M

***