R-17

Code: 7GC22

I B.Tech. II Semester Supplementary Examinations June 2024
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)
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UNIT–I

1.	a)	Give detailed procedure for the determination of dissolved oxygen in water.	7M
	b)	What is the principle of EDTA titration? Briefly describe the estimation of hardness of water by EDTA method.	7M

OR

2.	a)	Discuss in brief the boiler corrosion. How is it controlled?	7M
	b)	Why is sterilization of water necessary? Discuss any two methods of sterilization	7M

UNIT–II

3.	a)	Explain passivity of metals. How it affects rate of corrosion	7M
	b)	On dilution Equivalent Conductance of an electrolyte increases whereas Specific Conductance decreases. Explain.	7M

OR

4.	a)	Write a note on the mechanism of hydrogen evolution type of wet corrosion.	7M
	b)	Explain the composition, working and applications of Ni-Cd cell	7M

UNIT–III

5.	a)	Write a note on processing of raw rubber? Explain the draw backs of raw rubbers.	7M
	b)	Write a note on polydispersive index	7M

OR

6.	a)	Write a note on the classification of polymers with examples	7M
	b)	Differentiate Thermoplastic and Thermosetting plastics with suitable examples.	7M

UNIT–IV

7.	a)	Explain higher calorific value and lower calorific value and distinguish between the HCV and LCV.	7M
	b)	With a neat diagram describe the Orsat's gas analysis method. What are the special precautions to be taken in the measurement?	7M

OR

8.	a)	Write a note on synthesis of petrol by Fischer Tropsch's method.	7M
	b)	Compare the liquid fuels with gaseous fuels.	7M

UNIT–V

9.	a)	Explain the importance of refractories and their applications.	7M
	b)	Write functions of lubricants	7M

OR

10.		Describe the manufacture of Portland cement by wet method with a neat labelled diagram of rotary kiln.	14M

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R-17

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations June 2024

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)

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UNIT–I

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

   b) Evaluate $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}\,dx\,dy$ by changing to polar coordinates.   7M

OR

2. a) Trace the curve $r = a(1 - \cos_n)$.   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) Evaluate $\int_0^\infty t\,e^{-2t}\cos t\,dt$ 7M

   b) Find the Laplace Transform of $\int_0^t \int_0^t \int_0^t \cos a\,u\,du\,du\,du$ 7M

OR

4. a) Find the Laplace Transform of $\dfrac{\sin 3t \cos t}{t}$ 7M

   b) Find the Laplace Transform of $t\,e^{-t}\sin t$ 7M

UNIT–III

5. a) Find the inverse transform of $\dfrac{1}{s(s^2 + a^2)}$.   7M

   b) Find the inverse transform of $\dfrac{s+2}{s^2 - 4s + 13}$.   7M

OR

6. Find the inverse transform of $\log\left(\dfrac{s+1}{s-1}\right)$.   14M

UNIT–IV

7. Find the directional derivative of $f(x, y, z) = x\,y^2 + y\,z^3$ at the point $(2, -1, 1)$ in the direction of the vector $\bar{i} + 2\bar{j} + 3\bar{k}$ 7M

OR

8. a) Prove that $div\, curl\, \bar{F} = 0$ 7M

    b) Show that $\nabla^2 \left(\dfrac{1}{r} \right) = 0$ 7M

UNIT–V

9. Verify Green's Theorem for $\int_c \left[\left(3x - 8y^2 \right) dx + \left(4y - 6xy \right) dy \right]$ where 'c' is bounded by region bounded by $x = 0$, $y = 0$ and $x + y = 1$ 14M

OR

10. Verify stoke's theorem for a vector field $\bar{F} = \left(x^2 + y^2 \right) \bar{i} - 2xy\, \bar{j}$ taken round the rectangle bounded by the lines $x = \pm a$, $y = 0$, $y = b$.   14M

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Code: 7G121

I B.Tech. II Semester Supplementary Examinations June 2024
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)
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UNIT–I

1. a) What is a pointer? What are the features of pointers? Write a C program to print address of a variable   8M
    b) Write a C program to swap two numbers using pointers.   6M

OR

2. Compare array and pointers in terms of memory efficiency and execution time efficiency.   14M

UNIT–II

3. a) Define union. List out the differences between unions and structures   7M
    b) Write a program for sorting given numbers using selection sort technique   7M

OR

4. a) Define Structures. Explain with an example how structure members are initialized and accessed   8M
    b) Write a C program to find the given element using linear searching.   6M

UNIT–III

5. Write a program to implement a linear queue using arrays. Take into account the exceptions like Queue Full and Queue Empty.   14M

OR

6. a) What is Data Structure? Explain in detail about different type of data structures.   7M
    b) Write applications of stack   7M

UNIT–IV

7. Write advantages of doubly linked list over singly linked list. Write C function that will insert a given integer value into an ordered doubly linked list.   14M
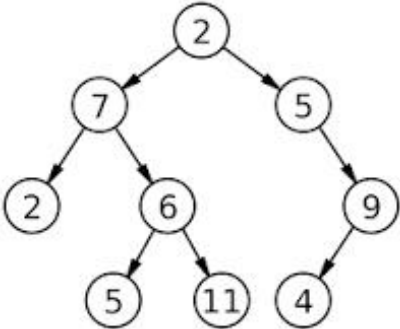
OR

8. What is a Singly Linked List.? Explain different operations of a singly linked list with suitable examples.   14M

UNIT–V

9. Define binary search tree. Explain with example deletion of an element from a binary search tree.   14M

OR

10. Write the recursive algorithms for different binary tree traversal techniques. Find all the tree traversals for the following binary tree:

14M

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