Hall Ticket Number :										

R-15

Code: 5GC22

I B.Tech. II Semester Supplementary Examinations April 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)

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Marks

UNIT–I

1. a) Explain the process of a phosphate, carbonate and sodium aluminate conditioning of boiler feed water 7M
   b) Give detailed procedure for the determination of dissolved oxygen in water. 7M

OR

2. a) What is break point chlorination? State its significance. 7M
   b) Write brief account on Priming and foaming. 7M

UNIT–II

3. a) Explain the differential aeration corrosion with suitable examples 7M
   b) On dilution Equivalent Conductance of an electrolyte increases whereas Specific Conductance decreases. Explain. 7M

OR

4. a) What is meant by molar Conductance and Equivalent conductance? Write their Units? 7M
   b) Explain the composition, working and applications of Ni-Cd cell 7M

UNIT–III

5. a) What is vulcanization of rubber? Explain why natural rubber needs vulcanization. How is it carried out? 7M
   b) Write a note on the classification of polymers with examples 7M

OR

6. Differentiate Thermoplastic and Thermosetting plastics with suitable examples. 14M

UNIT–IV

7. a) Explain higher calorific value and lower calorific value and distinguish between the HCV & LCV. 7M
   b) Describe how synthetic petrol is synthesized from Bergius process 7M

OR

8. a) Calculate the gross and net calorific value of a coal sample having the following composition carbon-85% hydrogen-8% sulphur-1% hydrogen-2% ash-4% latent heat of steam 587 cal/g 7M
   b) On burning 0.83 g of a solid fuel in bomb calorimeter, the temperature of 3500 g of water increased from 26.5^0 c to 29.2^0 c. Water equivalent of calorimeter and latent heat of steam for 385 grams and 587cal/g respectively. If the fuel contains 0.77% H calculator HCV and NCV. 7M

UNIT–V

9. a) What is cement? How do you classify the cement? 7M
   b) How are lubricants classified? Give examples 7M

OR

10. a) Write a note on the composition of Portland cement 7M
    b) Explain the importance of refractories and their applications. 7M

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Hall Ticket Number :										

R-15

Code: 5GC24

I B.Tech. II Semester Supplementary Examinations April 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)

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UNIT–I

1. a) Evaluate $\int_0^5 \int_0^{x^2} x\left(x^2+y^2\right) dy\, dx$ 7M

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

OR

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

   b) Change the order of integration in $\int_0^1 \int_0^{\sqrt{1-x^2}} y^2 dy\, dx$. 7M

UNIT–II

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

   b) Find the Laplace Transform of $f(t) = \begin{cases} 2\ , 0 \le t \le 1 \\ 2t\ , t \ge 1 \end{cases}$ 8M

OR

4. a) Find the Laplace Transform of i) $\cos 2t$ ii) $\sin 2t \sin 3t$ 7M

   b) Find $L^{-1}\left\{\frac{1}{(s-1)(s+3)}\right\}$ 7M

UNIT–III

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

OR

6. Solve the differential equation $\frac{d^2x}{dt^2} - 4\frac{dx}{dt} - 12x = e^{3t}$

   given that $x(0) = 1, x'(0) = -2$ using Laplace Transform 14M

UNIT–IV

7. a) Find $div\,\bar{F}$ and $curl\,\bar{F}$ where $\bar{F} = grad\left(x^3 + y^3 + z^3 - 3xyz\right)$ 7M

   b) Show that $div\left(grad\ r^n\right) = n(n+1)r^{n-2}$ 7M

OR

8. a) 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

   b) Prove that $\nabla r^n = n r^{n-2}\bar{r}$ where $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$ and $r = |\bar{r}|$ 7M

UNIT–V

9. Verify by Gauss Divergence theorem for $\bar{F} = x^3\bar{i} + y^3\bar{j} + z^3\bar{k}$ taken over the cube bounded by $x = 0, x = a; y = 0,\ y = a; z = 0, z = a$ 14M

OR

10. Verify Green's Theorem in the plane for $\int_c \left[\left(3x^2 - 8y^2\right)dx + (4y - 6xy)dy\right]$ where 'c' encloses the region bounded by $y = \sqrt{x}$ and $y = x^2$ 14M

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Hall Ticket Number :										

R-15

Code: 5G121

I B.Tech. II Semester Supplementary Examinations April 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)

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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. 42+8=50, will be treated as malpractice.

			Marks
		UNIT–I	
1.	a)	What is a pointer? What are the features of pointers? Write a C program to print address of a variable	7M
	b)	Write a C program to swap two numbers using pointers.	7M
		OR	
2.	a)	Using pointers write a C program which finds the maximum among the list of elements.	7M
	b)	Explain in detail about Dynamic Memory allocation with examples	7M
		UNIT–II	
3.	a)	Define union. List out the differences between unions and structures	7M
	b)	Explain different modes to open a file	7M
		OR	
4.	a)	Describe the uses and limitations of getc and putc.	7M
	b)	Write a program for sorting given numbers using selection sort technique	7M
		UNIT–III	
5.		Write a ‘C’ program for implementation of various operations on queue.	14M
		OR	
6.		What is a stack? How it can be represented in "C" using arrays?	14M
		UNIT–IV	
7.		Represent a doubly linked list using an array. Write routines to insert and delete elements for this representation.	14M
		OR	
8.		List the operations that can be performed on single linked list. In how many ways a node can be deleted from single linked list? Explain.	14M
		UNIT–V	
9.	a)	Define and describe the terms: Tree, Binary Tree, Complete Binary Tree and Degree of a tree.	8M
	b)	Define the following terms of graphs. i) Undirected graph ii) In degree iii) Digraph	6M
		OR	
10.	a)	Explain the operations on Binary Tree.	7M
	b)	Define graph. Explain About the basic Terminology of graphs.	7M

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