Hall Ticket Number :										

R-15

Code: 5GC22

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) What is the principle of EDTA titration? Briefly describe the estimate of hardness of water by EDTA method.
   b) What are the advantages of break-point chlorination?

OR

2. a) Explain the boiler troubles, scale and caustic embrittlement in details.
   b) Why is calgon conditioning better than phosphate conditioning?

UNIT–II

3. a) Explain the working principle of primary batteries including chemical reactions.
   b) Describe working procedure of electrochemical sensors with suitable examples

OR

4. a) Write a note on electrochemical corrosion.
   b) Explain the factors which effect the corrosion

UNIT–III

5. a) Write a note on synthesis of Nylon 6, 6 from 1,3-butadiene and uses of it.
   b) Differentiate between addition polymerization & condensation polymerization.

OR

6. a) Describe the synthesis, application & mechanism of conducting nature of polyacetylene.
   b) Write a note on thermoplastics and thermosetting plastics.

UNIT–IV

7. a) Explain the classification of fuels and write the characteristics for good fuel
   b) Explain Otto Hoffmann's by product oven process

OR

8. Explain the following
   i) Knocking ii) Octane number iii) Cetane number

UNIT–V

9. a) Explain the different raw materials and mixing of the raw materials by the dry process during the manufacture of cement
   b) What are Refractories? Explain Thermal spalling, strength and porosity of the refractories.

OR

10. Write short notes on the following properties of lubricants:
    (i) Cloud and Pour point (ii) Flash and Fire point.

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Hall Ticket Number :										

R-15

Code: 5GC24

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

   b) changing the order of integration $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dy\, dx$ 7M

OR

2. a) Evaluate $\int_0^a \int_0^x \int_0^{x+y} e^{x+y+z}\, dz\, dy\, dx$ 7M

   b) Find the area of the plate in the form of a quadrant (1st quadrant)of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ 7M

UNIT–II

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

   b) Find the Laplace Transform of $\left(\sqrt{t}-\frac{1}{\sqrt{t}}\right)^3$ 7M

OR

4. a) Using Convolution Theorem, Evaluate $L^{-1}\left\{\frac{s+2}{s^2-4s+13}\right\}$ 6M

   b) Find the Laplace Transform of $\int_0^t \frac{e^{-t}\sin t}{t}\, dt$ 8M

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

   b) Show the vector $(x^2-yz)\bar{i}+(y^2-zx)\bar{j}+(z^2-xy)\bar{k}$ is irrotational and find its scalar potential. 7M

OR

8. a) Show that $div(grad\ r^n)=n(n+1)r^{n-2}$ 7M

   b) Evaluate $divergence\ of\ (2x^2z\,\bar{i}-xy^2z\,\bar{j}+3yz^2\,\bar{k})$ at the point $(1,1,1)$. 7M

UNIT–V

9. Verify Divergence thermo for $\bar{F}=(x^2-yz)\bar{i}+(y^2-zx)\bar{j}+(z^2-xy)\bar{k}$ taken over the rectangular parallelepiped $0\le x\le a$, $0\le y\le b$, $0\le z\le c$ 14M

OR

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

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Hall Ticket Number :										

R-15

Code: 5G121

I B.Tech. II Semester Supplementary Examinations June 2024

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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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

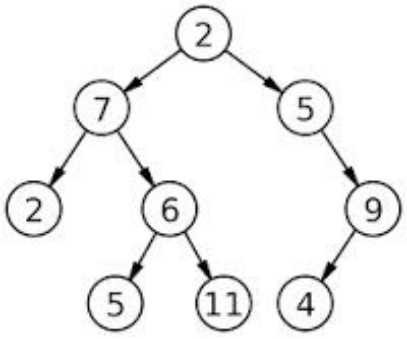
8. What is a Singly Linked List.? Explain different operations of a singly linked list with suitable examples. 14M

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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