| Hall Ticket Number : | | | | | | | | | | |
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**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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| Hall Ticket Number : | | | | | | | | | | |
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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 $\int_0^{\infty}\int_x^{\infty}\frac{e^{-y}}{y}dx\,dy$ 7M

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

**OR**

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

   b) Find the Laplace Transform of $\int_0^t\int_0^t\int_0^t\mathrm{Cos}\,a\,u\,du\,du\,du$ 7M

**OR**

4. a) Find the Laplace Transform of $\frac{\mathrm{Sin}\,3t\,\mathrm{Cos}\,t}{t}$ 7M

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

## UNIT–III

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

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

**OR**

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

## UNIT–IV

7. Find the directional derivative of $f\left(x,y,z\right)=x\,y^2+y\,z^3$ at the point $\left(2,-1,1\right)$ 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 $\nabla^2\left(\frac{1}{r}\right) = 0$ 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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| Hall Ticket Number : | | | | | | | | | | |
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**R-17**

**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**

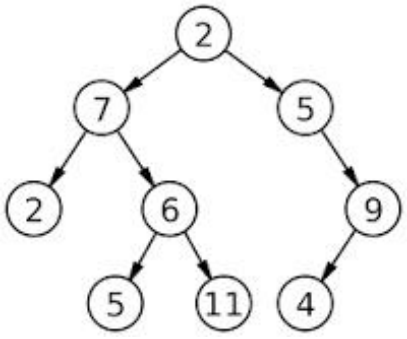
8. What is a Singly Linked List.? Explain different operations of a singly linked list with suitable examples. 14M

## 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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