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R-17

Code: 7GC14

I B.Tech. I Semester Supplementary Examinations June 2024

Engineering Mathematics-I

(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. Find the eigen values and eigen vectors of $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$

OR

2. Test for consistency and solve $5x+3y+7z=4, 3x+26y+2z=9, 7x+2y+10z=5$

UNIT-II

3. Prove that the matrix $\frac{1}{\sqrt{3}} \begin{bmatrix} 1 & 1+i \\ 1-i & -1 \end{bmatrix}$ is Unitary matrix.

OR

4. Reduce the matrix $A = \begin{bmatrix} -1 & 2 & -2 \\ 1 & 2 & 1 \\ -1 & -1 & 0 \end{bmatrix}$ to the diagonal form.

UNIT-III

5. A body is kept in air with temperature 25°C cools from 140°C to 80°C in 20 minutes. Find the when the body cools down to 35°C

OR

6. Solve $x \frac{dy}{dx} + y = x^3 y^6$

UNIT-IV

7. Solve $\frac{d^3y}{dx^3} - y = e^x + \sin 3x + 2$

OR

8. Solve $(D^2 + 1)y = \sin x \sin 2x + e^x x^2$

UNIT-V

9. Verify Rolles theorem for $f(x) = 2x^3 + x^2 - 4x - 2$ in $[-\sqrt{2}, \sqrt{2}]$

OR

10. Verify lagrange's mean value theorem for $f(x) = (x-1)(x-2)(x-3)$ in $[0, 4]$

Hall Ticket Number :

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R-17

Code: 7G511

I B.Tech. I Semester Supplementary Examinations June 2024

Problem Solving Techniques and C Programming

(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) What are the General Problem solving strategies? Discuss 7M
- b) Define Flowchart? Draw a flowchart to read three integers and find the biggest number. 7M

OR

2. a) Explain in detail about the computer environments. 7M
- b) Define Algorithm? What are the advantages of writing an Algorithm 7M

UNIT-II

3. a) Write and explain the structure of C Program 7M
- b) What is an identifier in C. Explain the rules of Identifiers. 7M

OR

4. a) What is Type Conversion? Illustrate type conversion with suitable examples. 7M
- b) Explain about the user defined data types in C language. 7M

UNIT-III

5. a) Write a C Program to find whether the given number is prime or not? 7M
- b) Write about the functioning of the jump statements, break and continue with suitable examples 7M

OR

6. What are Loop Control Statements in C. Explain them with suitable examples 14M

UNIT-IV

7. a) What is an Array? Explain how to declare one dimensional arrays with example. 7M
- b) Write a C Program to find whether the string is palindrome or not. 7M

OR

8. a) Write a C program to find the Average of all elements in the array. 4M
- b) What are the different String Library functions available in C? Explain them with example 10M

UNIT-V

9. a) What are type qualifiers in c language? Explain with suitable examples. 7M
- b) Write a C Program to find the factorial of a given number using recursion. 7M

OR

10. a) What is a function? What are the advantages of using functions in a program? 7M
- b) Explain function parameter passing techniques in C with suitable examples. 7M

Hall Ticket Number :

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R-17

Code: 7GC12

I B.Tech. I Semester Supplementary Examinations June 2024

Engineering Chemistry

(Common to CE, ME & CSE)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. What is hardness of water? How do you classify and express hardness? Determine the total, temporary and permanent hardness of water by EDTA method.

OR

2. a) Explain the process of a phosphate ,carbonate and sodium aluminate conditioning of boiler feed water
b) Write a short notes on
i) Break point chlorination ii) Caustic embrittlement

UNIT-II

3. a) Describe the construction and working of lithium ion battery
b) Discuss the different types of conductometric titrations with examples

OR

4. a) Explain the construction and working of Hydrogen-Oxygen fuel cell
b) Define corrosion. Explain dry corrosion and its mechanism.

UNIT-III

5. Explain with examples the terms: addition polymerization, condensation polymerization and co-polymerization.

OR

6. Give an account of preparation, properties and engineering uses of the following
(i) PVC (ii) Nitrile rubber (iii) poly phosphazines

UNIT-IV

7. a) Write short note on octane number and cetane number.
b) Describe the following
i) Natural gas ii) Bio gas

OR

8. a) How do you determine the calorific value of solid fuel experimentally?
b) Define calorific value of a fuel. Distinguish gross and net calorific value of fuel.

UNIT-V

9. a) Describe the essential properties of a good refractory material.
b) What is cement? Explain with the help of chemical reaction setting and hardening of cement

OR

10. a) What is Portland cement? Illustrate the manufacture of Portland cement by dry method with a neat labelled diagram of rotary kiln
b) Discuss the following properties of lubricants
(i) Cloud and pour point (ii) Aniline point
