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<b>R-15</b>
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**Code: 5G111**

I B.Tech. I Semester Supplementary Examinations March/April 2023

**Problem Solving Techniques and Introduction to 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 )

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<b>UNIT-I</b>
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Marks

1. a) Give a comparison between system and application software's with examples. 7M
- b) List and explain various symbols used in flowcharts with figures 7M

**OR**

2. a) Discuss about different computer languages with examples. 7M
- b) Explain in detail about the software development method. 7M

<b>UNIT-II</b>
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3. a) What are bitwise logical operators? Explain about bitwise logical operators with suitable programming example. 7M
- b) Evaluate the following expressions:  
(i)  $a*(3+b)/2-c++ *b$  where  $a=3, b=4$  and  $c=5$  (ii)  $!(4+5*0)>=6-4$  7M

**OR**

4. a) What is the need of explicit type conversion in C? How to cast the data? 7M
- b) What is the need of escape sequence? Write a sample program to illustrate escape sequences. 7M

<b>UNIT-III</b>
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5. a) Give the control flow diagram of the *for loop*. How is the execution of 'for' loop proceeds? 7M
- b) Write a C program to find biggest of three integer numbers. 7M

**OR**

6. a) Explain counter-controlled and condition-controlled loops with examples. 7M
- b) Write a C program to find the sum of first and last digit of a number 7M

<b>UNIT-IV</b>
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7. a) What are the different types of arrays in C? Explain with a suitable example, array declaration, initialization and accessing of the elements for these different types. 7M
- b) Write a C program to accept 3x3 matrix and display elements of the matrix. 7M

**OR**

8. a) Explain any five string manipulation functions with example 10M
- b) Write a program to find highest and smallest number in the given array. 4M

<b>UNIT-V</b>
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9. a) Write a C program to exchange the value of two integers using call by reference. 7M
  - b) Write a c program to find factorial of a number using recursive function 7M
10. a) Define scope. Briefly explain the scope, life time and visibility of Identifier. 7M
  - b) Explain about pre-processor commands with examples. 7M

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**R-15**

**Code: 5GC14**

I B.Tech. I Semester Supplementary Examinations March/April 2023

**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)

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**UNIT-I**

1. Solve the differential equation  $(x+1)\frac{dy}{dx} - y = e^{3x}(x+1)^2$

**OR**

2. Find the Orthogonal trajectories of the family of curves  $y = ax$

**UNIT-II**

3. Using the method of variation of parameters, solve  $(D^2 + 4)y = \tan 2x$

**OR**

4. Solve  $(D^2 + 4)y = x^2 + \cos 2x$

**UNIT-III**

5. Test of convergence of the series  $\frac{1}{1.2.3} + \frac{3}{2.3.4} + \frac{5}{3.4.5} + \dots \dots \dots \infty$

**OR**

6. Test for convergence of the series  $\sum \frac{n^3}{3^n}$

**UNIT-IV**

7. If  $u = x^2 - 2y, v = x + y + z, w = x - 2y + 3z$ , then find  $\frac{\partial(u, v, w)}{\partial(x, y, z)}$

**OR**

8. Find the maximum and minimum values of  $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$

**UNIT-V**

9. Trace the curve  $x^3 + y^3 = 3axy$

**OR**

10. Trace the curve  $r = a \sin 3\theta$

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**R-15**

**Code: 5GC15**

I B.Tech. I Semester Supplementary Examinations March/April 2023

**Mathematical Methods-I**  
( Common to CSE & IT)

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) Solve the system of equations  $x+y+w=0$ ,  $y+z=0$ ,  $x+y+z+w=0$ ,  $x+y+2z=0$  7M
- b) Reduce the matrix  $\begin{bmatrix} 0 & 1 & 2 & -2 \\ 4 & 0 & 2 & 6 \\ 2 & 1 & 3 & 1 \end{bmatrix}$  to normal form and hence find the rank 7M

**OR**

2. Find the values of p and q so that the equations  $2x+3y+5z=9$ ,  $7x+3y+2z=8$ ,  $2x+3y+pz=q$  have (i) No solution (ii) Unique solution (iii) An infinite number of solutions. 14M

**UNIT-II**

3. Find the matrix P which transform the matrix  $A = \begin{bmatrix} 1 & 0 & -1 \\ 1 & 2 & 1 \\ 2 & 2 & 3 \end{bmatrix}$  to the diagonal form. 14M

**OR**

4. Determine the modal matrix P of  $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 2 & 1 \\ -4 & 4 & 3 \end{bmatrix}$ . Verify that  $P^{-1}AP$  is a diagonal matrix. 14M

**UNIT-III**

5. Reduce the quadratic form  $10x^2 + 2y^2 + 5z^2 - 4yz - 10zx + 5xy$  to the canonical form by linear transformation. 14M

**OR**

6. Define Hermitian, skew-Hermitian, Unitary Matrices and give example for each 14M

**UNIT-IV**

7. Using the bisection method, find a real root of the equation  $\cos x = xe^x$  correct to three decimal places. 14M

**OR**

8. Find the real root of the equation  $x \log_{10} x = 1.2$  by Regular-false method correct to four decimal places. 14M

**UNIT-V**

9. Find  $f(2.5)$  using Newton's forward formula from the following table.

x	0	1	2	3	4	5	6
y	0	1	16	81	256	625	1296

14M

**OR**

10. Evaluate  $\int_0^6 \frac{1}{1+x^2} dx$ , by using (i) Weddle's rule (ii) Simpson's 3/8<sup>th</sup> rule. 14M

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