

Hall Ticket Number :

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R-15

Code: 5G111

I B.Tech. I Semester Supplementary Examinations December 2022

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)

UNIT-I

- 1. a) Differentiate between computer hardware and software 7M
- b) Write an algorithm to find product of two integers using repetitive addition 7M
- OR**
- 2. a) Explain in detail about the software development method. 7M
- b) List and explain various symbols used in flowcharts with figures 7M

UNIT-II

- 3. a) Discuss about operator precedence in expression evaluation with a suitable example. 7M
- b) Give the format for conditional operator. When is it used? 7M
- OR**
- 4. a) Explain different data types supported by C language with their memory requirements. 7M
- b) Describe the structure of a C program with example 7M

UNIT-III

- 5. a) Write a C Program to check whether given number is Armstrong number or not 7M
- b) Explain the significance of 'break' and 'continue' statement with a sample program. 7M
- OR**
- 6. a) Write 'C' program to print the Fibonacci sequence. 7M
- b) In what way a do – while loop differs from while loop. Explain. 7M

UNIT-IV

- 7. a) Write a program to print an array in reverse order 7M
- b) Write a C Program to delete 'n' characters in a given string 7M
- OR**
- 8. a) What is an Array? How to declare and initialize a one dimensional array? 4M
- b) Explain different string manipulation functions with example 10M

UNIT-V

- 9. a) What is the scope of variables of type extern, auto, register and static? Explain with example. 10M
- b) What is meant by user defined function? Explain with an example C program 4M
- OR**
- 10. a) What is a function? What are its advantages? Explain various parameter passing techniques. 10M
- b) Write a function that checks whether a given year is leap year or not. 4M

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R-15

Code: 5GC14

I B.Tech. I Semester Supplementary Examinations December 2022

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. a) A bacterial culture, growing exponentially, increases from 100 to 400 grams in 10 hours. How much was present after 3 hours 7M
- b) Find the Orthogonal trajectories of the family of parabolas $y^2 = 4ax$ 7M

OR

- 2. Find the Orthogonal trajectories of the family of curves $r = a(1 + \cos \theta)$ 14M

UNIT-II

- 3. Using the method of variation of parameters, solve $(D^2 + a^2)y = \sec ax$ 14M

OR

- 4. Solve $(D^2 + 4)y = \sin x$ 14M

UNIT-III

- 5. a) Expand $\sin x$, by using Maclaurin's theorem. 7M
- b) Verify Rolle's Theorem for $f(x) = e^x(\sin x - \cos x)$ in $\left(\frac{f}{4}, \frac{5f}{4}\right)$ 7M

OR

- 6. If $f(x) = \sin^{-1} x, 0 < a < b < 1$, use Mean value theorem to prove that 14M
- $$\frac{b-a}{\sqrt{1-a^2}} < \sin^{-1} b - \sin^{-1} a < \frac{b-a}{\sqrt{1-b^2}}$$

UNIT-IV

- 7. If $u = \sin^{-1}\left(\frac{x^2 + y^2}{x + y}\right)$, then prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \tan u$ 14M

OR

- 8. Given $x + y + z = a$, find the maximum value of $x^m y^n z^p$ 14M

UNIT-V

- 9. Trace the curve $x = a(\theta + \sin \theta), y = a(1 + \cos \theta)$ 14M

OR

- 10. Trace the curve $r = a(1 - \cos \theta)$ 14M
