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Roll No. :

328451(28)

B. E. (Fourth Semester) Examination, 2020

APR-MAY 2022

(New Scheme)

(Et & T Branch)

NUMERICAL ANALYSIS Using C

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory and carries 2 marks. Attempt any two from (b), (c) and (d) which carry 7 marks each.

Unit - I

1. (a) What is a data types?

- (b) Explain with C-code, various types of conditional structure in C.
- (c) Write program that accepts the radius of a circle and prints its area and the perimeter.
- (d) What are Operators? List various types of operators available in Turbo C and give their precedence, if any.

Unit - II

2. (a) What are the various types of looping structure in C?
- (b) Explain the working of Nested for loop with example in C.
- (c) Differentiate between call by value and call by reference.
- (d) What is the difference between "while loop" and "do-while" loop?

Unit - III

3. (a) What is the difference between an array and a structure?

- (b) Write a C program to find transpose of a 3×4 matrix.
- (c) What is String? How are they declared? Write a program to copy one string to another without using the standard library functions.
- (d) What is Recursion? Explain it with the help of example.

Unit - IV

4. (a) What do you mean by Algebraic equation?
- (b) Apply Regula-Falsi method to solve the equation $3x - \cos x - 1 = 0$.
- (c) Using Newton's iterative method, find the real root of $x \log_{10} x = 1.2$ correct to five decimal places.
- (d) Solve the following equation by Gauss-Seidal method :

$$83x + 11y - 4z = 95$$

$$7x + 52y + 13z = 104$$

$$3x + 8y + 29z = 11$$

Unit - V

5. (a) Define Simpson's one-third rule.
- (b) Evaluate

$$\int_0^6 \frac{dx}{1+x^2}$$

by using (i) Trapezoidal rule, (ii) Simpson's '1/3' (iii) Simpson's '3/8' rule and compare the results with its actual value.

- (c) Using Euler's method solve the differential equation for y at $x = 1$ in five steps :

$$\frac{dy}{dx} = x^2 + y^2, y(0) = 1$$

- (d) Apply Runge-Kutta method of fourth order to solve :

$$10 \frac{dy}{dx} = x^2 + y^2, y(0) = 1 \text{ for } x = 0.1$$