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320555(20)

B. E. (Fifth Semester) Examination, April-May 2021

(New Scheme)

(Civil Engg. Branch)

NUMERICAL METHODS & COMPUTER PROGRAMMING

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all question. Part (a) is compulsory from each question & carry 2 marks. Attempt any* ***two*** *parts from part (b), (c) and (d) from each question & carries 7 marks.*

Unit-I

1. (a) Define constants & variables.

(b) Define operators. Explain the basic operators in C++.

(c) What are control statements? Explain for, while &

do-while constructs.

(d) Write a C++ program to compute bending moment & shear force at every quarter point along the span of a simply supported beam carrying a uniformly distributed load.

Unit-II

2. (a) What are library functions?

(b) Explain the following :

(i) Function declaration

(ii) Function definition

(iii) Function calling

(c) Define arrays. Write a program to sort an array of integers in ascending (Increasing value) order.

(d) Write a program to find transpose of a matrix.

Unit-III

3. (a) What is the purpose of initgraph?

(b) Explain the follwing functions :

(i) Circle ( )

(ii) Arc ( )

(iii) Ellipse ( )

(iv) Line ( )

(c) Write a program to draw a simple T-section.

(d) Write a program to draw two concentric circles of different radius.

Unit-IV

4. (a) Explain the term curve fitting.

(b) Solve the following equation by Gauss elimination method:

$$2x + y + z = 10$$

$$3x + 2y + 3z = 18$$

$$x + 4y + 9z = 16$$

(c) Solve the following set of simaltaneous equations using Gauss-Jordan method :

$$2x + y + 3z = 6$$

$$2x+2y+z=5$$

$$2x+3y+2z=7$$

(d) Fit a second degree parabola to the following data :

x :	0	1	2	3	4
y :	0	1·8	1·3	2·5	6·3

Unit-V

5. (a) Write down the types of finite differences.

(b) Give that :

x	10	11	12	13	14	15	16
y	7·989	8·403	8·781	9·129	9·451	9·750	10·031

Create a forward difference table.

(c) Apply Runge Kutta fourth order method to find an approximate value of y when $x=0.2$ given that $\frac{dy}{dx}=x+y$ and $y=1$ when $x=0$.

(d) Apply Milne's method, to find a solution of the differential equation $y'=x-y^2$ in the range

$0 \le x \le 1$ for the boundary condition $y=0$ at $x=0$.