

320515(20)

B. E. (Fifth Semester) Examination, 2020

(Old Scheme)

(Civil Engg. Branch)

**NUMERICAL METHODS and COMPUTER
PROGRAMMING**

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

***Note : Part (a) of each question is compulsory.
Attempt any two part (b), (c) and (d) of each
questions.***

Unit-I

1. (a) Write the differences between C and C++. 2
- (b) Explain all loop statement with syntax and example. 7

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- (c) Write a C++ program to determine the support reactions in a simply supported beam subjected to any number of points loads. 7
- (d) Write a C++ program to print largest of three numbers. 7

Unit-II

2. (a) What is function? 2
- (b) What is the difference between call by value and call by reference? 7
- (c) Write a C++ program to perform addition of two matrices. 7
- (d) Write a C++ program to determine moment of resistance of singly reinforced beam. 7

Unit-III

3. (a) What is graphics function? 2
- (b) Write a C++ program to draw a simple T-section. 7
- (c) Write a graphics program to draw the cross-section of a singly reinforced beam of rectangular cross section. 7

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- (d) Explain the following graphics functions : 7
- (i) Rectangle ()
- (ii) Line ()
- (iii) Closegraph ()
- (iv) arc ()
- (v) putpixel ()
- (vi) initgraph ()
- (vii) bar ()

Unit-IV

4. (a) What are the various method of solving linear algebraic equations? 2
- (b) Solve the following equation by Gauss Elimination method : 7
- $$x + y + z = 10$$
- $$3x + 2y + 3z = 18$$
- $$x + 4y + 9z = 16$$
- (c) Solve the following set of simultaneous equation using Gauss-Jordan Method : 7

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$$2x_1 + 3x_2 + 4x_3 = -10$$

$$3x_1 + 4x_2 + 5x_3 = 13$$

$$x_1 - 2x_2 + 2x_3 = 11$$

(d) Using the following table to fit a curve of the form

$$y = ax^b. \quad 7$$

$$x = \quad 10 \quad 20 \quad 30 \quad 40 \quad 50 \quad 60 \quad 70 \quad 80$$

$$y = \quad 1.06 \quad 1.33 \quad 1.52 \quad 1.68 \quad 1.81 \quad 1.91 \quad 2.01 \quad 2.11$$

Unit-V

5. (a) Prove that : 2

$$E = e^{hD}$$

(b) Using Runge-Kutta Method of fourth order, solve

$$\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2} \text{ with } y(0) = 1 \text{ at } x = 0.2, 0.4. \quad 7$$

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

$$y(0.1) = 1.06, \quad y(0.2) = 1.12, \quad y(0.3) = 1.21$$

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evaluate $y(0.4)$ by Milne's predictor corrector method. 7

(d) Write a C++ program to solve an ordinary differential equation by Runge-Kutta Fourth order method. 7