

H

Roll No.

TMA-502

**B. TECH. (CSE) (FIFTH SEMESTER)
MID SEMESTER EXAMINATION, 2022
COMPUTER BASED NUMERICAL AND
STATISTICAL TECHNIQUES**

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) Find the roots of the equation $x^2 + 4 \sin x = 0$ by Newton-Raphson method correct to four decimal places.

10 Marks (CO1)

OR

- (b) Find the roots of the equation $x^2 - \log_e x - 12 = 0$ correct to 3 decimal places by Regula-Falsi method.

10 Marks (CO1)

P. T. O.

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2. (a) Solve the system of linear equations using Gauss Elimination method :

10 Marks (CO1)

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

$$6x + 4y + 3z = 0$$

$$20x + 15y + 12z = 0.$$

OR

- (b) Solve the equations $x + y + 2z = 4$;

$$3x + y - 3z = -4; \quad 2x - 3y - 5z = -5;$$

by Gauss-Jordan method. 10 Marks (CO1)

3. (a) From the following table, estimate the number of students who obtain marks between 45 and 55 : 10 Marks (CO2)

Marks	No. of Students
30—40	31
40—50	42
50—60	51
60—70	35
70—80	31

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OR

- (b) Find the cubic polynomial which takes the following values. Hence find $f(2.75)$:

10 Marks (CO2)

X	$f(x)$
0	1
1	2
2	1
3	10

4. (a) The population of a certain town is given below. Find the population in 1955 using central difference formula :

10 Marks (CO2)

Year (X)	Population (Y) (in thousands)
1931	40.62
1941	60.80
1951	79.95
1961	103.56
1971	132.65

P. T. O.

OR

(b) What are the different methods of interpolation for unequal interval ? Given

$$u_3 = 6, u_5 = 24, u_7 = 58, u_9 = 108,$$

$$u_{11} = 104, \text{ find } u_{100}. \quad 10 \text{ Marks (CO2)}$$

5. (a) What are significant figures ? What are the different methods to convert an approximate number to significant figures ?

Explain with examples. If $\pi = \frac{22}{7}$ is

approximated as 3.14, find the absolute, relative and percentage error.

10 Marks (CO1)

OR

- (b) Solve the equations $27x + 6y - z = 85;$

$$x + y + 54z = 110; \quad 6x + 15y + 2z = 72;$$

by Gauss-Seidel method. 10 Marks (CO1)