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Roll No. .....

TBC–302

B. C. A. (THIRD SEMESTER)
MID SEMESTER EXAMINATION, 2021

COMPUTER BASED NUMERICAL TECHNIQUE

Time : 1½ Hours

Maximum Marks : 50

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

(ii) Each question carries 10 marks.

1. (a) Describe representation of floating-point numbers and explain the term errors in numerical. 10 Marks (CO1)

OR

(b) Round off the number 865250 and 37.46235 to four significant figures and compute E_a, E_r, E_p in each case. 10 Marks (CO1)

P. T. O.

2. (a) Solve the following system of equations using Gauss-Jordan method :

10 Marks (CO2)

$$x + y + z = 9$$
$$2x - 3y + 4z = 13$$
$$3x + 4y + 5z = 40$$

OR

(b) Solve the following system of equations using Gauss Elimination : 10 Marks (CO2)

$$2x + y + z = 10$$
$$3x + 2y + 3z = 18$$
$$x + 4y + 9z = 16$$

3. (a) Find a root of the equation $x^3 - 4x - 9 = 0$ using Bisection method, correct upto three decimal places.

10 Marks (CO1)

OR

(b) Find the root of the equation $\cos x = xe^x$ using the Regula-Falsi method correct to three decimal places. 10 Marks (CO1)

4. (a) Solve by Jacobi's iteration method, the equations :

$$10x + y - z = 11.19$$
$$x + 10y + z = 28.08$$
$$-x + y + 10z = 35.61$$

correct to the three decimal places.

10 Marks (CO2)

OR

(b) Solve by Gauss-Seidel iteration method, the equations :

$$20x + y - 2z = 17$$
$$3x + 20y - z = -18$$
$$2x - 3y + 20z = 35$$

correct to the three decimal places.

10 Marks (CO2)

5. (a) Find the E_a, E_r, E_p if the number $X = 0.004997$ is :

(i) Truncated to three decimal digits

(ii) Rounded off to three decimal digits

10 Marks (CO1)

OR

(b) Find the positive root of $x^4 - x = 10$ correct to three decimal places, using Newton-Raphson method.

10 Marks (CO1)

430