

Total No. of Questions : 4]

SEAT No. :

P8546

[Total No. of Pages : 2

Oct-22/TE/Insem-509
T.E. (Chemical Engineering)
CHEMICAL ENGINEERING MATHEMATICS
(2019 Pattern) (Semester - I) (309343)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates :

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data if necessary.*

Q1) a) Apply Newton Raphson method to find the root of the equation $x^4 - x - 10 = 0$. Do two iterations only. [8]

b) Derive formula for Newton Raphson method. [7]

OR

Q2) a) Using Bisection method find the root of the equation $x^3 - 1.8x^2 - 10x + 17 = 0$ that lies between the interval (1, 2) at the end of two iterations. [8]

b) Use Secant method to determine the root of equation $f(x) = e^{-x} - x = 0$. [7]

Q3) a) Solve the following system of equations using Gauss Elimination method. [8]

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

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

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

b) Explain LU decomposition method in detail. [7]

P.T.O.

OR

Q4) a) Solve the following equations by Gauss Seidal method. [8]

$$4x + y + z = 5$$

$$x + 6y + 2z = 19$$

$$-x - 2y + 5z = 10$$

b) Solve the following system of equations using Gauss Jordan method. [7]

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

$$3x + 5y + 2z = 15$$

$$2x + y + 4z = 8$$

