B.E (chemical + MBA/FT) 5th Sem

20/1/2022

Numerical Methods in Chem. Engg.

Total Marks: 25

1. Apply Runge-Kutta 4th order method, to find an approximate value of y when $x = 0.2$, given that $\frac{dy}{dx} = x + y$ & $y = 1$ when $x = 0$ —— (5)

2. Apply Gauss elimination method, to solve the equations $x + 4y - z = -5$, $x + y - 6z = -12$, $3x - y - z = 4$

— (5)

3. Solve, by Jacobi's Iteration method, the equations $20x + y - 2z = 17$, $3x + 20y - z = -18$, $2x - 3y + 20z = 25$

— (5)

4. Using Picard's process of successive approximation, obtain a solution upto the 5th approx. of the equation $\frac{dy}{dx} = y + x$, such that $y = 1$ when $x = 0$. check your answer by finding the exact particular solution.

—— (5)

5. Apply Milne's method, to find a solution of the differential equation $y' = x - y^2$ in the range $0 \leq x \leq 1$ for the boundary conditions $y = 0$ at $x = 0$.

— (5)