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Roll No .....

CM-503 (GS)

B.E. V Semester Examination, June 2020

Grading System (GS)

Computational Methods in Chemical Engineering

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. Determine the maximum step size that can be used in the tabulation of $f(x) = e^x$ in [0,1], so that the error in linear interpolation be less than 5×10^{-4}.

2. Why are Lagrange and Newton systems for interpolation ill-conditioned?

3. Use a 3rd order Lagrange interpolating polynomial to predict y at $x = 1.25$ for the following data:

x	y
1	0.14
1.1	0.21
1.2	0.33
1.3	0.54
1.4	0.92

4. What do you mean by Variance? Outline the properties of variance. What do you mean by confidence limit?

5. What is a numerical solution of a differential equation. Also define Picard's theorem.

6. Solve $y' = \sin x + \cos y$ for $x = 3(0.5)$ 4 with the initial value of y (0) = 2.5 using Runge Kutta fourth order method.

7. Find the general solution to the ODE $y'''' + 5y'' - 36y = 0$.

8. Define three fundamentally different types of second-order quasi-linear PDEs.

OR

What is the advantages of the FEM over finite difference (FDM) and finite volume (FVM) methods?

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