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Roll No

CM-5002-CBGS

B.E. V Semester

Examination, June 2020

Choice Based Grading System (CBGS)

Computational Methods in Chemical Engineering

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) How do you find the area under a curve using integration?
b) What is interpolation and extrapolation in computational methods?
2. Using Runge Kutta method of fourth order, $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with solve with $y(0) = 1$. Find the solution at $x = 0.2$ and 0.4 .
3. a) What is meant by significant figures? How it is used in the chemical engineering calculations and reports?
b) What is meant by measurement? Discuss the classification of measurement with suitable example.
4. a) What is interpolation and extrapolation in computational methods?
b) Explain Gauss backward formula to find differences which lie on the line.

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5. a) Write the properties of Mean and Variance.
b) Write the difference between the properties of variance and standard deviation.
6. a) Explain the following terms with suitable example :
 - i) Graphical integration
 - ii) Graphical construction of integral curves.b) What is meant by empirical equations? Discuss the different methods of plotting the empirical equations to give straight lines.
7. Classify the ordinary differential equation? With the help of one example related to chemical engineering derive the governing equation in the form of ordinary differential equation. Also suggest the solution methodology for the same.

OR

- a) Use Lagrange's formula and compute $f(0)$ at $x = 0$, for a cubic polynomial interpolation with 4 points
 $(x, y) = (-1, 1.25), (1, 2), (2, 3), (4, 0)$.
- b) Explain Gauss backward formula to find differences which lie on the line.
8. a) Define standard techniques used for the stability analysis of PDEs.
b) Define Dirichlet and Neumann boundary conditions.

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