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Roll No

MCADD-302

M.C.A. (Dual Degree/Integrated Course), III Semester

Examination, November 2018

Computer Oriented Numerical Methods

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) Each question carry equal marks.

1. a) Discuss truncation errors, relative and absolute errors.
b) Solve $x^4 - 5x^3 + 20x^2 - 40x + 60 = 0$ by Newton-Raphson method given that all the roots of the given equation are complex.
2. a) Find a real root of $2x - \log_{10}x = 7$ correct to three places of decimal using iterative method.
b) Explain zeros of polynomial using bisections.
3. a) Discuss Lagrange's interpolation and inverse interpolation for equal and unequal intervals.

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- b) A curve is drawn to pass through the points given by the following data:

x	y
1.0	2
1.5	2.4
2.0	2.7
2.5	2.8
3.0	3
3.5	2.6
4.0	2.1

Using Simpson's rule find the area bounded by the curve, the x-axis and the lines $x = 1$, $x = 4$.

4. a) Explain Picard's series. How it is different from Taylor's series.
b) Compute $y(0.1)$ and $y(0.2)$ by Runge-Kutta fourth order method for the differential equation.

$$\frac{dy}{dx} = xy + y^2, y(0) = 1$$

5. Fit a binomial distribution for the following data and compare the theoretical frequency with the actual ones:

x	y
0	2
1	14
2	20
3	34
4	22
5	8

[3]

6. a) Discuss χ^2 distribution with appropriate example.
b) Write the difference between rectangular distribution and hyper geometric distribution.
7. Two random samples drawn from 2 normal population are as the follows:

A	B
17	16
27	16
18	20
25	27
27	26
29	25
13	21
17	

Test whether the samples are drawn from the same normal population.

8. Write short notes on the following:
- Hypothesis testing for sampling
 - Chi-square test
