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Roll No

MCADD-302

M.C.A. (Integrated), III Semester

Examination, June 2020

Computer Oriented Numerical Methods

Time : Three Hours

Maximum Marks : 70

- Note:** i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Explain arithmetic operations for normalized floating point numbers Giving examples.
b) Using Newton-Raphson method find the real root of the equation $x \log_{10} x - 1.2 = 0$ correct to three decimal places.
2. a) Find the root of the equation $x^3 - 2x - 5 = 0$ by the method of false position correct to 3 decimal places.
b) Explain five types of errors and how each can be minimized.
3. a) Find the polynomial of the lowest degree by using Newtons divided difference formula for the following data.

$x:$	0	1	4	5	7
$f(x):$	8	11	68	123	163

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b) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using

i) Simpson's $\frac{1}{3}$ rule

ii) Simpson's $\frac{3}{8}$ rule

4. a) Use Newton's forward interpolation formula for estimating the number of students. Who obtained marks between 40 and 45.

Marks:	30-40	40-50	50-60	60-70	70-80
No.of Students:	31	42	51	35	31

b) Derive mean and variance of Binomial distribution.

5. a) Fit a normal distribution to the following data:

Mid point :	100	95	90	85	80	75	70	65	60	55	50	45
Frequency:	0	1	3	2	7	12	10	9	5	3	2	0

b) Five dice were thrown 192 times and the number of time 4, 5 or 6 were as follows.

No.of dice throwing:	5	4	3	2	1	0
4,5 or 6						
f :	6	46	70	48	20	2

Calculate χ^2 .

6. a) Solve the following system of equation using Gauss-Seidel method.

$$28x + 4y - z = 32$$

$$x + 3y + 10z = 24$$

$$2x + 17y + 4z = 35$$

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Contd...

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- b) Given $\frac{dy}{dx} = -2xy^2$ with $y(0) = 1$, find $y(1.0)$ by taking $h = 0.5$, using Runge-Kutta method.
7. a) Show how you would use students t-test to decide whether the two sets observations.
17, 27, 18, 25, 27, 29, 27, 23, 17
and 16, 18, 20, 16, 20, 17, 15, 21
Indicate samples drawn from the same universe.
- b) Write short notes on:
i) Hypergeometric distribution
ii) Inverse interpolation
8. a) Define following.
i) Null hypothesis
ii) Level of significance
iii) Standard error
iv) Testing of hypothesis
- b) Show that poisson distribution is the limiting form of the Binomial distribution.

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