Roll No ....

MCADD-302

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

Examination, November 2022

Computer Oriented Numerical Methods

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions 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 the root of the equation $xe^x - \sin x = 0$ using False positon method correct to three decimal places.
   b) Solve by Newton raphson method $x^3 - 3x - 4 = 0$.

3. a) Find f(g) from the following table:

x:	5	7	11	13	17
f(x):	150	392	1452	2366	5202

   b) Evaluate $\int_0^{\pi/2} \sqrt{\cos\theta}\ d\theta$

4. a) Evaluate $\int_0^6 \frac{1}{1+x^2} dx$ by using Weddle's rule.

   b) Solve $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,$

   $x + y + 54z = 110$ by Gauss Seidel iteration method.

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

6. a) Define Poisson distribution and find its mean and variance.

   b) Prove that the mean deviation from the mean of the normal distribution is $\dfrac{4}{5}$ times its standard deviation.

7. a) The mean and variance of a binomial distribution $p(x, n, p)$ are 4 and 4/3 respectively. Find $p(x \geq 2)$ and the probability of two successes.

   b) A Car-hire firm has two cars, which if hires out day by day. The number of demands for a car on each day is distributed as a Poisson distribution with mean 1.5. Calculate the proportion of days on which neither car is used and the proportion of days on which some demand is refused (given that $e^{-1.5} = 0.2231$)

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

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