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1482/III

B.C.A. (Part-II[nd]) EXAMINATION, 2023-24

(Third Semester)

BCA 302 : COMPUTER ORIENTED MATHEMATICS

Paper : II

Time : Three Hours] [Maximum Marks : 70

Note: (i) Answer five questions in all.

(ii) Question No. 1 is compulsory.

(iii) Answer remaining four questions. Selecting two from each Section A and B.

(iv) All questions carry equal marks.

(v) Non-programmable scientific calculators are allowed.

1. (a) What do you mean by approximate value ?

(b) List any three methods for the solution of transcendental equation and name the best approach to solve it.

(c) Explain about derivatives of a f^n.

(d) Explain with suitable example about "Mean" of given values.

Section-A

2. Define the interpolation. For unequal intervals data series which formula is used ? Solve the following with that method to evaluate f (9)

x	50	75	110	130	172
f(x)	150	392	1452	2366	5020

3. For finding the roots of nonlinear equation describe Newton Raphson method. Find the solution of $\sqrt{N}$, where N is a positive integer 39 upto two decimal places.

4. Solve the following system of equations.

$$10x + y + 2z = 40$$

$$2x + 10y + z = 57$$

$$x + 2y + 10z = 71$$

by using gauss Scidel method.

5. Calculate the mean, median and mod for the following data :

Size of items	0	1	2	3	4	5	6	7	8	9
Frequency	3	6	8	5	4	2	1	0	0	1

Section-B

6. (a) Use the slope formula to find $\frac{d}{dx}(x^3 - 7x)$.

(b) 50 children used guessed the number of marbles in a jar and the average guess was 627. However three of the guesses were way too high and so were excluded then the average guess was reduced by 114, what is the mean of the three outliers ?

7. (a) If $f(1) = 5$, $f(2) = 8$, $f(3) = 37$ and $f(4) = 77$ find $f(1.5)$.

(b) Evaluate $\int_0^1 \frac{dx}{1+x}$ by using trapezoidal and Simpson's 3/8 rule.

8. (a) Calculate the value of $\sqrt{102} - \sqrt{101}$, correct to four significant figures. Find Absolute and relative error if you take only two significant figures as approximate value of each also.

(b) By using gauss-elimination, solve the following :

$x + 2y + 3z = 1$

$x + 3y + 2z = 2$

$3x + 3y + 4z = 1$

9. Attempt any two of the following :

(a) Find the mean and median of 7, 12, 10, 15, 9 and explain measure of central tendency with examples.

(b) Find the positive root between 0 and 1 of the equation $x = e^{-x}$.

(c) How to calculate inverse of the given matrix?

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