x	0	1	2	5
f(x)	2	3	12	147

(8)

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SE1790

MATH242 Enrol. No. .....

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SUPPLEMENTARY EXAMINATION :
JULY – AUGUST 2022

APPLIED MATHEMATICS – IV

Time : 3 Hrs. *Maximum Marks : 60*

Note: ***Attempt questions from all sections as directed. Use of Scientific table, normal distribution table is allowed.***

SECTION – A (24 Marks)

Attempt any **four** *questions out of* **five**.
Each question carries **06** *marks.*

1. Find the approximate root of $x \log_{10} x - 1.2 = 0$, correct up to three decimal places, using Newton Raphson method.

2. Compute the values of $\int_{0.2}^{1.4} (\sin x - \log x + e^x) dx$ using Simpson's $3/8^{th}$ rule.

3. In a normal distribution 31% of items are under 45 and 8% are over 64. Find the mean and standard deviation of the distribution.

4. In a certain factory turning out razor blades, there is a small chance of 0.002 for any blade to be defective. The blades are supplied in packets of 10. Calculate the approximate number of packets containing no defective, one defective and two defective blades in a consignment of 10,000 packets.

5. Show that the line of fit to the following data is $y = 0.7x + 11.285$

x	0	5	10	15	20	25
y	12	15	17	22	24	30

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three**.

Each question carries **10** *marks.*

6. Solve

$9x + 4y + z = -17,\ x - 2y - 6z - = 14,\ x + 6y = 4$

using Jacobi method.

7. A curve passes through the point (0,18), (1,10), (3,–18) and (6,90). Find the slope of the curve at x=2.

8. (a) Calculate the first four moments about the mean of the following data :

x	0	1	2	3	4	5	6	7	8
f	1	8	28	56	70	56	28	8	1

(6)

(b) Evaluate $\Delta^2\left[\frac{5x+12}{x^2+5x+6}\right]$, taking the interval of difference as unity. (4)

SECTION – C (16 Marks)

(Compulsory)

9. (a) Use Runge's Kutta method $10y' = x^2 + y^2$, $y(0) = 1$ to evaluate $y(0.4)$. (8)

(b) Find the cubic polynomial from the following table :