Reg. No:

Time: 3 hours   Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 Find real root of the equation $3x = e^x$ using Bisection method.   **L3**   **12M**

OR

2 From the following table values of x and $y = \tan x$. Interpolate the values of y **L5**   **12M**
when $x = 0.12$ and $x = 0.28$.

x	0.10	0.15	0.20	0.25	0.30
y	0.1003	0.1511	0.2027	0.2553	0.3093

UNIT-II

3 Using Runge-Kutta method of fourth order, solve $\dfrac{dy}{dx} = x^2 - y$, $y(0) = 1$.   **L3**   **12M**

Find $y(0.1)$ and $y(0.2)$.

OR

4 Evaluate $\displaystyle\int_0^1 \frac{1}{1+x}\,dx$ **L5**   **12M**

(i) Using Trapezoidal rule and Simpson's $\dfrac{1}{3}$ rule.

(ii) Using Simpson's $\dfrac{3}{8}$ rule and compare the result with actual value.

UNIT-III

5 a Find arithmetic mean to the following data   **L3**   **6M**

x	1	2	3	4	5
f	5	8	10	12	6

   b The first four moments of a distribution about the value 5 of the variables are 2,   **L3**   **6M**
20, 40 and 50. Calculate mean, variance, β_1 and β_2 of the distribution.

OR

6 a Determine $(i)\, P\left(B/A\right)$, $(ii)\, P\left(B/A^c\right)$ if A and B are events with   **L3**   **6M**

$P(A) = \dfrac{1}{3}, P(B) = \dfrac{1}{4},\ P(A \cup B) = \dfrac{1}{2}.$

   b In a certain town 40% have brown hair, 25% have brown eyes and 15% have   **L3**   **6M**
both brown hair and brown eyes. A person is selected at random from the town.
(i) If he has brown hair, what is the probability that he has brown eyes also? (ii)
If he has brown eyes, determine the probability, that he does not have brown
hair?

UNIT-IV

7 A random variable X has the following probability function   L3   12M

X	0	1	2	3	4	5	6	7
$P(X)$	0	K	$2K$	$2K$	$3K$	K^2	$2K^2$	$7K^2+K$

Determine (i) K (ii) Mean (iii) Variance (iv) if $P(X \le K) > \dfrac{1}{2}$, find the minimum value of K.

OR

8 For the continuous probability function $f(x) = \begin{cases} kx^2 e^{-x} & ; when\ x \ge 0 \\ 0; elsewhere \end{cases}$ L3   12M

Find (i) k (ii) Mean (iii) Variance.

UNIT-V

9 Out of 800 families with 5 children each, how many would you expect to have   L2   12M
(i) 3 boys (ii) 5 girls (iii) either 2 or 3 boys (iv) At least one boy.

OR

10 Find two regression equations from the following data: L3   12M

X	10	25	34	42	37	35	36	45
Y	56	64	63	58	73	75	82	77

*** END ***