LM3ADF

TIME : 2 Hrs. **MARKS : 60**

Instructions :-

1) All questions of section-I and section - II are compulsory.
2) Attempt any two sub questions out of three from each question.
3) Graph paper will be provided on request.
4) Each sub questions carries 6 marks.
5) Use of simple calculator is allowed.

SECTION - I

Q.1 Attempt any two of the following :-

a) A garment manufacturer is planning production of a new variety of shirts. It involves initially a fixed cost of Rs. 1,50,000 and a variable cost of Rs. 150 for producing each shirt. If each shirt can be sold at Rs. 350; then find
i) Cost Function ii) Revenue function iii) Break - even point. [6]

b) If the demand law is $x = 25 - P^2 - 3P$, find the elasticity of demand when $P = 3$. [6]

c) Differentiate the following :- [6]

i) $\frac{e^x}{1 + x^2}$ ii) $x^3 \log x$

Q. 2. Attempt any <u>two</u> of the following :-

a) A perso lent Rs. 8,000 for 4 years and Rs. 6000 for 3 years at the same rate of simple interest. If he received totally Rs. 3000 as interest, find the rate of simple interest. [6]

b) Ramya takes a loan of Rs. 2,50,000 from a friend at 10% p.a. flat rate of interest for a period of 4 years. Compute the EMI. [6]

c) How long it would take for an annuity due of Rs. 5000 p.a. to become Rs. 25525.50 at 10% p.a. compounded annually. [6]

SECTION - II

Q. 3. Attempt any <u>two</u> of the following :-

a) Calculate product moment coefficient of correlation between X and Y.

X :	7	5	4	11	10	12	14	9
Y :-	14	8	8	19	16	19	20	16

[6]

b) Given the following data find two regression equations.

$\overline{X} = 6$, $\overline{Y} = 11$, $\sigma x = 2$, $\sigma y = 5$, $r = 0.5$

c) Calculate the rank correlation coefficient for the following data giving working capital in lakhs of Rs. (x) and profit in thousands of Rs. (y) of ten companies for the year 1990 - 1991.

X :	15	32	25	30	35	20	19	22	27	31
Y :	50	70	65	72	90	58	53	57	68	74

[6]

Q. 4. Attempt any <u>two</u> of the following :-

a) Find a trend curve by using 4 yearly moving averages for the following data :-

Year	1991	1992	1993	1994	1995	1996	1997
Production	30.00	32.00	31.50	30.50	32.00	34.50	33.80

Year	1998	1999	2000	2001
Production	33.00	32.50	35.00	34.50

[6]

b) Fit a straight line trend for the following :-

Year	2001	2002	2003	2004	2005	2006	2007
Sales	15	20	24	31	38	46	54

[6]

c) Construct Laspeyrels and paaschels Index number from the following data.

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	6	50	9	55
B	2	100	2	125
C	4	60	6	65
D	10	30	14	25

[6]

Q. 5. Attempt any <u>two</u> of the following :-

a) In a certain city 20% of persons are Vegetarians. If 5 persons from the city are chosen at random, find the probability that

i) non is Vegetarian

ii) at least one is Vegetarian. [6]

b) A random variable X fallows poisson distribution with mean = 2.5 find

i) $P(X = 3)$ ii) $P(X = 2)$

iii) $P(X \leq 2)$ Given $e^{-2.5} = 0.08208$ [6]

c) A random variable X has normal probability density function with mean 50 and variance 25. find i) $P(45 < X < 58)$ ii) $P(X < 40)$ [6]

[Area under the standard normal curve from Z = 0, Z = 1 is 0.3413 and for Z = 1.6 is 0.4452 for Z = 0 to Z = 2 is 0.4772 0