1) All questions carry equal marks.
2) Use of simple calculator is allowed.
3) Figures to right indicate full marks.

SECTION-I

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a) Find the coefficient of correlation for the following:

X	53	59	72	43	93	35	55	80
Y	35	49	63	36	75	28	38	71

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b) Find 3-yearly moving average and plot on the graph.

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004
Export	464	515	518	467	502	540	557	571	586

OR

a) Calculate Rank Correlation coefficient.

X	52	47	65	43	54	66	75	70
Y	65	59	72	82	60	57	58	90

b) Fit straight line trend using least square method.

Year	2000	2001	2002	2003	2004	2005	2006
Import	48	50	58	52	45	41	49

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2 a) Find two regression equations and find Y when X = 40 also X when Y = 35

	X	Y
Mean	43	37
S.D.	3.1	2.8

Correlation Coefficient r = 0.59

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b) What are the types of Index number?

OR

a) Find $\overline{X}$ and $\overline{Y}$ also the coefficient of correlation. If regression equations are $x + 3y - 88 = 0$ and $2x + y - 71 = 0$

b) Write note on Business forecasting.

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Q.3 a) Calculate price index number I_L, I_P and I_F.

	1981		1991	
Item	Price	Quantity	Price	Quantity
A	3	10	5	12
B	4	15	6	20
C	2	8	5	15
D	3	10	8	16

b) For the following pay-off table select best decision using EMV and EOL criteria.

	S_1	S_2	S_3
A_1	80	60	110
A_2	40	0	50
A_3	100	−20	70
Probability	0.3	0.2	0.5

OR

a) Calculate Index number by:

(i) Weighted average of price relative

(ii) Weighted aggregative method

Price in Rs.			
Commodity	Base year	Current year	Weight
A	550	1345	130
B	630	1250	450
C	150	3350	75
D	450	778	225
E	225	886	120

b) A manager has to make a choice from 3 available courses of action A_1, A_2 and A_3. There are 2 possible states of nature S_1 and S_2 with probabilities of occurrences 0.7 and 0.3 respectively for S_1 the pay off are ₹ 25,000, ₹ 35,000 and ₹ 20,000 respectively while for state S_2 pay offs are ₹ 45,000, ₹ 50,000 and ₹ 35,000 respectively. Represent the problem with the help of decision tree.

SECTION-II

a) The production cost to each book is ₹ 70 and the fixed cost is ₹ 3,00,000. The book is sold for ₹ 270 each. Determine   6

   (i) Cost function   (ii) Revenue function   (iii) Break-even point.

b) The total cost function is given by $e = x^3 + 2x^2 + x + 5$ find the average cost and marginal cost when $x = 5$ 6

OR

a) The demand function is $y = \dfrac{(x + 2)}{(x - 1)}$ find the elasticity of demand when X = 3.

b) Differentiate with respect to X.

   (i) $y = 5x^2 (7x - 3e^x)$ (ii) $y = \dfrac{x^2 - 2x + 5}{x + 1}$

a) Sumedh takes a loan of ₹14,50,000 from a bank for a period of 5 years at 9% p.a. compounded   12
interest. Compute the EMI using reducing balance.

OR

a) What amount kept for 4 years at 8% p.a. will generate the Simple Interest same as the simple   6
interest genrated by ₹ 12,000 for 3 years at 8% p.a.?

b) Find the maturity amount of 2 years fixed deposit of ₹ 3,30,000 at 6% p.a. if the interest is   6
compounded
   (i) Annually
   (ii) Semi-annually