

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

**SECTION-I**

- 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 |

- 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   |

Q. 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  $r = 0.59$

- b) What are the types of Index number?

**OR**

- a) Find  $\bar{X}$  and  $\bar{Y}$  also the coefficient of correlation. If regression equations are  $x + 3y - 88 = 0$  and  $2x + y - 71 = 0$
- b) Write note on Business forecasting.

P.T.O

**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:
- Weighted average of price relative
  - 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  $A_3$ . The 2 possible states of nature  $S_1$  and  $S_2$  with probabilities of occurrences 0.7 and 0.3 respectively. For state  $S_1$  the pay off are ₹ 25,000, ₹ 35,000 and ₹ 20,000 respectively while for state  $S_2$  pay off are ₹ 45,000, ₹ 50,000 and ₹ 35,000 respectively. Represent the problem with the help of

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

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

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OR

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

- b) Differentiate with respect to X.

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

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

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OR

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

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

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(i) Annually

(ii) Semi-annually

----- The End -----