

[Time: 3:00 Hrs.]

[ Marks: 100]

Please check whether you have got the right question paper.

- N.B:
1. All questions are compulsory.
  2. Figures to the right indicate full marks.
  3. Use of non-programmable simple calculator is allowed.
  4. Graph paper will be provided on demand of student.
  5. Both the sections written on same answer sheet.

**Section-I****Q.1** Attempt any Four of the following:

- a) For the Demand function  $D = 75 + 6p - p^2$ , find the demand when price is 10 and 5  
also find the price when Demand is 75. 5
- b) The total cost function is given by  $C = 10 + 4x + x^2$ . Find the average cost and 5  
marginal cost when  $x = 2$ . 5
- c) Differentiate the following with respect of x. 5
  - i)  $y = 5x^7 + 4x^3 - 3\log x + 25$ .
  - ii)  $y = x^4 \log x$
- d) Find the price elasticity of demand when  $p = 2$ , for the demand function  $D = 25 - 5$   
 $3p - p^2$ . 5
- e) The demand and supply curves of a commodity are given by  $D = 19 - 3p - p^2$  and 5  
 $S = 5p - 1$ . Find the equilibrium price and the quantity exchanged. 5

**Q.2** Attempt any Four of the following:

- a) What amount kept for 4 years at 8%p.a. will generate the simple interest same as the 5  
simple interest generated by Rs. 12,000 for 3 years also at 8%p.a.? 5
- b) Compute the compound amount and compound interest of Rs.1200 If invested at 9% 5  
for 2 years and the interest compounded quarterly. 5
- c) Mr. Sameer Khan needs Rs.3,00,000 for his new business after 3 years. He wishes to 5  
put aside some money now in a bank giving 8% compound interest p.a., so that after 3  
years he would get the required amount. How much should he put aside now? 5

- d) Mr. Patil took a loan of Rs.60,000 with 10% p.a. to be repaid in 4 years. Calculate EMI using reducing balance method and flat interest rate method. 5
- e) Mr. Kirti has purchased a car with down payment Rs.50,000. If dealers charge 7% for 3 years with monthly installment Rs.3,500. Find the purchased price of car. 5

### Section-II

**Q.3** Attempt any Four of the following:

a) Write the short note on scatter diagram. 5

b) Find the coefficient of correlation for the following data: 5

X	2	5	8	10	6	3	1
Y	4	6	7	8	5	4	3

c) Marks of 5 candidates with respect to attributes A and B are given by: 5

A	40	50	20	30	45
B	20	45	30	35	47

Find Spearman's coefficient of correlation.

d) For the following data: 5

X:	2	4	6
Y:	6	2	1

Find: i) The equation of the lines of Regression Y on X.

ii) Estimate the value of Y, when  $X = 1$ .

e) We are given two regression lines 5

$$y \text{ on } x: 4x + 3y = 10$$

$$x \text{ on } y: 5x + y = 7$$

Find  $\bar{X}$ ,  $\bar{Y}$ ,  $b_{yx}$  and  $b_{xy}$ .

**Q.4** Attempt any Four of the following:

a) Explain the simple average method to find the seasonal indices of a time series. 5

- b) Fit a linear trend by the least square method to the following data and estimate the 5 trend value for 2008.

Year	2001	2002	2003	2004	2005	2006	2007
Disinvestment In PSU in cr's	265	270	280	290	300	320	310

- c) Find the Lespeyre's, Paasche's and Fisher's weighted index numbers for the 5 following data.

Commodities	Base Year		Current year	
	Price	Quantity	Price	Quantity
	$p_0$	$q_0$	$p_1$	$q_1$
A	30	3	40	5
B	15	2	20	4
C	10	6	30	3
D	6	5	12	10

- d) Using three yearly moving average determine the trend values for the given data. 5

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Production In (1000 units)	121	120	123	125	124	122	125	126	125	126

- e) The following table gives the prices of certain commodities in the year 2000 and 2007. Find their Simple Average Relatives Index number. 5

Commodities	I	II	III	IV	V
Price in 2000	50	165	25	60	45
Price in 2007	150	55	100	40	90

**Q.5** Attempt any Four of the following:

- a) State the properties of normal distribution. 5
- b) For the Normal distribution the limits of middle 50% of the observations are 250 and 350. Find Median, Standard deviation, Mean deviation. 5
- c) If 8% of the mobiles are produced by a Nokia a defective, the production of the company are 50 mobiles per day. Find the probability that, i). None of the defective mobile. ii). 4 mobiles are defective. 5
- d) In a lottery game there are 10 tickets. 3 tickets have a prize of Rs. 2, 2 tickets have a prize of Rs. 5 and 1 ticket has a prize of Rs. 10. The remaining tickets are blank. Find the expectation of a player winning a prize. 5
- e) For binomial variable X, mean of X is 4 and variance of X is  $\frac{4}{3}$ . Find  $P(x=0)$ . 5

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