

- Instructions :
- 1) All questions are compulsory
  - 2) Figures to the right indicate full marks.
  - 3) Simple calculator is allowed

Q.1. a) Draw an ogive for the following data. Hence locate (i) Median (ii)  $Q_1$  &  $Q_3$

Age in years	No. of insurance policy holders
10 - 14	10
14 - 18	13
18 - 22	15
22 - 26	30
26 - 30	20

b) The mean wage of 200 workers working in three shifts in a factory is Rs. 520. The average of 90 workers working in the first shift is Rs. 500. The average of 60 workers working in the second shift is Rs. 450. What is the average of workers working in the third shift.

c) Write short Note on cost of living Index.

Q.2. A) Prices of a particular commodity for five yrs. in two cities A and B are give

below:  
Find Mean and standard deviation for both the cities. Which city has more stable price ?

Price in city A (Rs.)	20	22	19	23	26
Price in city B (Rs.)	10	20	18	12	15

b) Find the cost of living index No. using family budget method for the following data.

Commodity	Price in R.		Quantity
	Base Yr	Current Yr	
A	4	6	15
B	20	25	25
C	4	8	5
D	25	35	30
E	6	9	8

c) Given  $f(x) = \begin{cases} x-2, & \text{for } 1 < x \leq 2 \\ 2x-1, & \text{for } 2 < x < 4 \\ 25, & \text{for } 4 \leq x \leq 5 \end{cases}$

Find  $f(2)$ ,  $f(4)$ ,  $f(4.5)$

Q.3. a) Write the properties of Arithmetic Mean



- b) If  $f(x) = 2x^3 - 9x^2 - 24x + 69$ , find the values of  $x$ , for which the function  $f(x)$  is  
 (i) Increasing (ii) decreasing (5)
- c) The total cost function is,  $C = Q^3 - 100Q^2 + 15Q$ , where  $Q$  is the number of unit produced. Find  $Q$  for which average cost is decreasing. Find also the value of  $Q$  for which the average cost is minimum. (5)

OR

- a) (i) Find  $\frac{d^2y}{dx^2}$  for  $y = x^6 e^x$   
 (ii) Find  $\lim_{h \rightarrow 0} \frac{a^{x+h} - a^x}{h}$  (4)

- b) For the following data lesbeyre's and paasche's Index No. are equal. Find X (6)

Commodity	Price in Rs.		Quantity	
	Base Yr.	Current Yr.	Base Yr.	Current Yr.
A	4	6	6	5
B	6	x	4	4

- c) Calculate Q. D. and coefficient of Q.D. for the following data. (5)

Life in hours	No. of tubes
600 - 800	20
800 - 1000	60
1000 - 1200	80
1200 - 1400	30
1400 - 1600	10

Q. 4. a) Find  $\frac{dy}{dx}$  where

- (i)  $y = x^3 \cdot e^x$   
 (ii)  $y = x^7 \cdot \log 7$  (5)

- b) (i) The demand  $D$  of a good when its price is  $P$  is given by  $D = \frac{16}{P}$ . Find the rate of change of demand  $p$ , when the price is 4.

- (ii) The supply  $S$  of a good when the price of the good is  $P$  is given by  $S = 3P^2 + 4$ . Find the rate of change of supply when the price is 2 (5)



c) (i)  $\lim_{x \rightarrow 4} \frac{x^2 - 9}{x - 3}$  Evaluate

(ii)  $\lim_{x \rightarrow 0} \frac{x}{\sqrt{9 - x} + x^2 - 3}$  Evaluate (5)

**OR**

- a) For the first year, the fixed cost for setting up a new electronic calculators company is Rs. 3,00,000. The variable cost for producing a calculator is Rs. 70. The company expects the revenue from the sales of the calculator to be Rs. 270 per calculators. Find the minimum number of calculators that should be produced and sold in the first year to ensure no Loss. (5)
- b) Find Fisher's Index number from the following data. Also find Dorbish - Bowlerly Index No.

Commodity	Base year.		current year	
	Price	Quantity	Price	Quantity
A	3	75	4	80
B	4	100	5	120
C	7	125	8	125
D	8	25	7	60

(5)

- c) The A.M. and S. D. of the values of 100 items in a group are 80 and 5. In a second group of 25 items. each item has a value equal to 60. Find the A.M. and the S.D. of the values of the 125 items of the two groups taken together (5)



Commodity	Price in K.	Quantity
	Base Yr	Current Yr
A	3	75
B	4	100
C	7	125
D	8	25