

Note :

1. Figures to the right indicate full marks.
2. Use simple calculator.
3. Graph paper is not necessary.
4. All questions are compulsory.

Q.1 A) Define : a) Population and sample
b) Frequency distribution. [4]

B) Following data have the ages of 20 couples, where X is age of husband any Y is age of wife. Prepare a frequency distribution with class intervals for X taken as 20-25, 25 - 30 so on and for Y as 15 - 20, 20 - 25 so on. [6]

X :	27	29	30	37	39	24	26	41	34	28	25	26	36	38	29	30
Y :	22	25	29	32	39	23	27	37	29	26	23	27	30	31	28	28

X :	22	24	21
Y :	18	19	18

C) Draw less than ogive curve and locate median. [5]

Weight :	100 - 110	110 - 120	120 - 130	130 - 140	140 - 150	150 - 160
No. of persons :	4	26	32	28	18	2

OR

Q.1 A) For the following distribution mode is given as 55. Find the missing frequency. [5]

Class Int. :	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80	80 - 90
Freqn :	10	15	30	50	--	15	5

B) Find the arithmetic mean and Q1 from the following frequency distribution. [6]

Income (Rs.) :	100 - 200	200 - 300	300 - 400	400 - 500	500 - 600	600 - 700
No. of persons :	120	200	170	220	100	90

C) i) What is the Geometric mean of 2, 2³ and 2⁵.

ii) What is the median of : 10, 15, 7, 9 & 22 [4]

Q.2 A) Explain Dispersion . [2]

B) Find Range and coefficient of Range for the given readings of temperature of Mumbai in a week [2]

- C) Calculate the standard deviation and coefficient of variation for the following data of profits of 20 vendors in a day. [6]

Profit	No. of Vendors
400 - 500	2
500 - 600	4
600 - 700	8
700 - 800	3
800 - 900	3

- D) Find Karl Pearson's coefficient of correlation between the internal and external marks of 6 students in a subject, Also interpret the result. [5]

	Marks	
	Internal	External
12		68
14		75
23		85
18		75
10		70
19		74

OR

- Q.2 A) Define correlation with scatter diagrams. [3]

- B) Find Spearman's Coefficient of Rank Correlation for the data giving the number of hours of daily practice and number of minutes taken to run a track by 5 runners. [5]

No. of hours practice (X) :	3	2	3.5	2	4
No. of min. to run track (Y) :	7	9	8	8.75	8.25

- C) Find mean deviation about median for the following data. Also find its coefficient. [5]

X :	15	20	28	30	32	45	50
Y :	1	2	2	5	3	1	1

- D) The Value of quartile deviation for a data is 9.5. The value of lower quartile is given to be 30. Find the upper quartile. [2]

- Q.3 A) Calculate Laspeyre's Index no. and Paasche's Index no. for the following date. [5]

Commodity	Base year		Current year	
	Price	Quantity	Price	Quantity
A	8	20	10	22

- B) i) Find the regression equation for the following data $n = 6, \sum x = 1, \sum y = 3$
 $\sum x^2 = 7, \sum xy = 30$ Also estimate y when $x = 10$. [4]
 ii) What is the point of intersection of two regression lines? [1]
 iii) What is the product of the two coefficients of regression? [1]

C) Find the trend values using a 3 yearly moving average. [4]

Year :	1971	1972	1973	1974	1975	1976	1977	1978	1979
No. of Workers :	60	61	63	62	62	64	63	64	65

OR

Q.3 A) Two regression equations are $3x + 2y - 26 = 0$ and $6x + y - 31 = 0$, Find the mean values of \bar{X} and \bar{Y} and the coefficient of correlation (r) between X and Y . [5]

B) Calculate Fisher's index numbers for following data : [5]

Commodity	Price		Quantity	
	1996	1997	1996	1997
A	2	3	74	76
B	5	4	125	140
C	7	6	40	50
D	9	12	30	30
E	6	5	100	110

(Consider 1996 as base year)

C) Find the seasonal indices : [5]

Year	Quarters			
	I	II	III	IV
1991	106	100.4	97.1	105.7
1992	107.2	108.6	107.3	110.5
1993	107.6	100.0	96.5	96.0
1994	91.5	89.1	86.4	94.1
1995	91.7	91.0	84.4	91.7

Q.4 A) Define probability and its law of addition. [3]

B) i) If two dice are thrown simultaneously, what is the probability that you will get some number on both dice. [3]

ii) A box contains 5 blue and 8 green balls. If two balls are selected at random from this box what is the probability that (a) They both are

C) Find expected value (mean) and variance of the expenses from data below: [6]

Expense :	0	500	1000	1500	2000	2500	3000
Probability :	0.35	0.25	0.15	0.10	0.08	0.05	0.02

OR

Q.4 A) Define (i) Testing of hypothesis

(ii) Type I and Type II error.

B) If probability of A winning a race is $\frac{1}{6}$ and prob. of B winning it is $\frac{1}{8}$.

Find the probability that neither should win. [6]

C) An urn contain 8 marbles of which an unknown number on are green.

To test the hypothesis $H_0: M = 4$ against the alternative $H_1: M = 5$ following procedure is used. Draw two marbles from the urn and reject H_0 if both are green. Find the probability of Type I and Type II error. [5]

A	2	* * * * *	76
B	5		140
C	7		50
D	9		30
E	8		110

Year	Quarters			
	I	II	III	IV
1991	106	100.4	97.1	105.7
1992	107.2	108.6	107.3	110.2
1993	107.6	100.0	96.2	96.0
1994	91.2	89.1	80.4	94.1
1995	91.7	91.0	84.4	91.7

Q.4 A) Define probability and its law of addition.

Q.3 A) Calculate Laspeyres index no. and Paasche's index no. for the following

	Current year		Base year	
	Price	Quantity	Price	Quantity
(i) If two dice are thrown simultaneously, what is the probability that you will get some number on both dice				
(ii) A box contains 5 blue and 8 green balls. If two balls are selected at				