

**Instructions :**

- 1) Section I is compulsory.
- 2) Solve any 3 questions from section II
- 3) Only simple calculators are allowed.
- 4) Figures to the right indicate full marks.

**SECTION - I**

**Q. 1 A)** For the following data, find combined average if both the groups are taken together. (2)

	<b>Gr. I</b>	<b>Gr. II</b>
No. of observations	85	65
Average	325	487

**B)** Define : i) Coefficient of Range (2)  
 ii) Coefficient of Quartile deviation.

If  $Q_1 = 23.6$ ,  $Q_3 = 54.5$ , Find quartile deviation.

**C)**  $P(A) = 0.5$ ,  $P(B) = 0.6$  and (2)  
 $P(A \cup B) = 0.9$  for any two events defined on sample space S Then find  
 $\theta(A \cap B)$ ,  $P(A)$ ,  $P(B')$ ,

**D)** Define : i) Value index number (2)  
 ii) independent events

**E)** Find geometric mean for the following data. (4)

$X_i$ :	133	148	363	466	821
$F_i$ :	2	3	4	3	5

**F)** Find the missing frequency for the following data given that arithmetic mean is 38 (3)

Marks :	10	20	30	40	50	60	70
No. of Students :	8	11	20	25	-	10	3

**Q. 2 A)** The profits made by 20 vegetable vendors on a particular day are given below (6)

<b>Profit in Rs.</b>	<b>No. of vendors</b>
200-300	7
300-400	10
400-500	12
500-600	18
600-700	11
700-800	5

Find (i) Median (ii) lower quartile  $Q_1$   
and (iii) Mode for the above data.

B) Find variance and standard deviation for the following data giving distribution of ages (in yrs.) of LIC policy holders. (5)

Ages (in yrs.)	No. of policyholders
16-20	4
20-24	7
24-28	7
28-32	5
32-36	3

C) The two regression lines for a certain bivariate data are found to be (4)

$$4y - 15x + 530 = 0 \quad \text{and} \quad 20x - 3y - 975 = 0$$

Find : i)  $\bar{x}$  and  $\bar{y}$   
ii) Correlation coefficient  $r$ .

### SECTION - II

(Solve any Three)

Q. 3 A) Find : (i) Laspeyre's Index Number (5)  
(ii) Paasche's Index Number  
(iii) Fisher's Index Number for the following data

Commodity	1990		2000	
	Price	Quantity	Price	Quantity
Sugar	20	55	35	60
Wheat	11	10	20	15
Rice	24	80	27	70
Oil	60	50	90	40
Miscellaneous	80	20	100	35

B) Give merits and demerits of median. (2)

C) Find 3- yearly moving averages for the following data and plot the - curves. (3)

Week	Production (in '000 Kg)
1	900
2	850
3	830
4	930
5	950
6	960

Week Production (in '000 Kg)

7	910
8	940
9	925
10	950
11	970
12	930

Q. 4 A) Following is the bivariate data giving height (X) in cm. and weight (Y) in kg. of some children. (5)

Then (X, Y) Values are

(88,24), (92,22), (87,26), (89,34), (104,32), (100,27), (102,36), (92,27)  
 (97,35), (98,25), (88,22), (90,31), (96,23), (98,38), (87,38), (101,32)  
 (91,23), (87,28), (91,25), (95,33),

Prepare bicariate frequency distribution taking

Class intervals for X : 85 -90, 90-95, .....

Class intervals for Y : 20-25, 25-30, .....

Write marginal frequency distribution of X Write conditional frequency distribution when  $Y > 30$

B) Give definition of (5)

- Sample space
- Mutually exclusive events.

A committee of 4 is to be formed from 3 engineers and 5 supervisors.

Find the probability that the committee contains.

- 2 engineers & 2 superuisors.
- at least 3 supervisors.

Q. 5 A) Find correlation coefficient between profit per unit (X) and output (Y) using following data. (6)

output (1000 tons)	Profit per unit (Rs.)
7	3
10	8
15	10
12	6
11	5
8	7
6	10

Also find regression equation of profit (X) on ourput (Y).

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B) Given the following data find the missing values. (4)

	Group I	Group II	Group I & II combined	
Number	100	200	--	--
Average	40	43	--	--
Variance	25	--	10	21

Q. 6 A) If X is a variable with Normal distribution with  $\mu = 100$  and  $\delta = 10$ , then find area under the normal curve such that  $P(110 < X < 125)$  (2)

B) Following data gives the income distribution of some workers in factories A and B. (5)

Income (in 100 Rs.)	No. of Workers	
	Factory A	Factory B
10-12	10	12
12-14	15	20
14-16	8	10
16-18	6	5

Which factory shows more variability ?

C) For the following distribution of sales of some shops, plot (3)

(i) Frequency polygon

(ii) Histogram.

Find mode only from the graph.

Class - Interval	Frequency
300-500	15
500-700	23
700-900	28
900-1100	30
1100-1300	10
1300-1500	5

