

- N.B. :-
- 1) Attempt all questions.
 - 2) Figures to the right indicate marks.
 - 3) Use of calculator is allowed.

Q.1 a) Explain the concept and utility of measuring correlation between two variables. Define Karl Pearson's coefficient of correlation and interpret its limiting values. 7

- b) The line of regression of y on x for a bivariate data is $5y + 3x = 42$ and the line of regression of x on y is $2x + y = 30$
Find i) the coefficient of correlation r between x and y.
ii) the most probable value of x when $y = 12$ 6

OR

Q.1 a) What is regression ? Why are there two regression lines ? Discuss properties of regression equations. 7

- b) Calculate Spearman's rank correlation coefficient for the following data -

x :	35	37	38	42	44	46	51	54
y :	40	32	39	40	41	31	50	32
x :	55	56						
y :	46	55						

 6

Q.2 a) What is an index number ? What are the various problems involved in the construction of index numbers ? 7

- b) Construct price index numbers from the following data by applying
i) Fisher's method ii) Bowley's method.

Commodities	Base year		Current year	
	Price	Quantity	Price	Quantity
A	2	3	4	6
B	5	10	6	5
C	4	14	5	5
D	2	19	2	13

OR

Q.2 a) What is an index number ? Discuss briefly Fixed base index number and chain base index numbers ? 7

- b) Construct a cost of living index number with the help of the data given below-
- | Item | Weight | Base year
Price (Rs.) | Current year
Price (Rs.) |
|------|--------|--------------------------|-----------------------------|
| 1 | 25 | 2.50 | 1.75 |

Q.3 a) Explain what is meant by consistence of data in case of data on attributes. Also state the criterion for consistency in case of 3 attributes. 6

b) By calculating Yule's coefficient of association Q, determine whether vaccination can be regarded as a preventive measure for small pox form the following data -
 'of the 1482 persons in a locality exposed to small-pox, 368 in all were attacked.
 'of 1482 persons, 343 had been vaccinated and of these only 35 were attacked. 6

OR

Q.3 a) When do we say that two attributes A and B are i) completely associated ii) Completely dissociated ? Define coefficient of colligation in case of two attributes A and B. 6

b) Find the remaining class frequencies in the following case-
 N = 1050 (A) = 800 (B) = 600
 (C) = 550 (AB) = 400 (AC) = 400
 (BC) = 200 (ABC) = 50 6

Q.4 a) What do you understand by simple Random sampling ? Explain any one method of drawing a simple random sample. 6

b) Fit a straight line $Y = a + bx$ to the following data -
 Year (x) : 1991 1992 1993 1994 1995
 Production (y) : 210 224 250 280 310 6

OR

Q.4 a) How will you fit a curve $y = a \cdot x^b$, given n pairs of values ? 6

b) A survey was conducted to study the relationship between expenditure on accomodation (x) and expenditure on food and entertainment (y). The following results were obtained -

Expenditure on	mean	s.d.
Accomodation (x)	173	63.15
Food & entertainment (y)	47.8	22.98
Coeff. of correlation (r)	0.57	

Write down the equation of regression of y on x and estimate the expenditure on food and entertainment (y) if the expenditure on accomodation is 200. 6