

**Bachelor of Science (B.Sc.I.T.) Semester—III (C.B.S.) Examination****STATISTICAL METHODS****Paper—VI**

Time : Three Hours]

[Maximum Marks : 50

**Note :—** (1) All questions are compulsory and carry equal marks.

(2) Assume suitable data wherever necessary.

**EITHER**

1. (a) How is census and sample investigation used in Statistics ? Explain. 5  
 (b) Define Statistics and explain its importance. 5

**OR**

- (c) Define tabulation and give its characteristics and objects. 5  
 (d) Discuss the different sources for collecting primary data. 5

**EITHER**

2. (a) Define Geometric mean. Derive the formula  $G = \text{Antilog} \left( \frac{1}{N} \sum_{i=1}^n f_i \log x_i \right)$  for the geometric

mean of frequency distribution :

 $x : x_1, x_2, \dots, x_n$  $f : f_1, f_2, \dots, f_n$ 

5

- (b) The distribution of 100 families according to their expenditure per week is given below :

Expenditure : 0 – 10    10 – 20    20 – 30    30 – 40    40 – 50

Number of

families :    14            ?            27            ?            15

The median and mode of the distribution are 25 and 24 respectively. Calculate the missing frequencies. 5

**OR**

- (c) What is frequency curve ? Explain its types. 5  
 (d) Calculate the mean for the following frequency distribution :

Class-interval : 0 – 8    8 – 16    16 – 24    24 – 32    32 – 40    40 – 48

Frequency :    8            7            16            24            15            7 5

**EITHER**

3. (a) What do you mean by dispersion ? Explain the measures of dispersion. 5  
 (b) What is Kurtosis ? Explain its importance. 5

**OR**

- (c) Find the mean and standard deviation of the following series :

Expenditure	No. of students
Below Rs. 5	6
Below Rs. 10	16
Below Rs. 15	28
Below Rs. 20	38
Below Rs. 25	46

5

- (d) Calculate the first four moments of the following distribution about the mean and hence find  $\beta_1$  and  $\beta_2$  :

 $x : 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8$  $f : 1 \quad 8 \quad 28 \quad 56 \quad 70 \quad 56 \quad 28 \quad 8 \quad 1$ 

5

**EITHER**

4. (a) Prove that the correlation coefficient is independent of change of origin and scale . 5  
 (b) Obtain the regression equation of Y on X for the following distribution :

$$f(x, y) = \frac{Y}{(1+x)^4} \exp\left(-\frac{Y}{1+x}\right); x, y \geq 0. \quad 5$$

**OR**

- (c) Calculate the correlation coefficient between the heights of father (X) and of the sons (Y) from the following data :

X :	65	66	67	68	69	70	71	67	
Y :	67	68	64	72	70	67	70	68	5

- (d) What is linear regression ? Explain with the help of Scatter Diagram. 5

5. Attempt **all** :

- (a) Explain what precautions are to be taken while using secondary data. 2½  
 (b) Define Harmonic Mean. Give its merits and demerits. 2½  
 (c) Give the characteristics for an ideal measure of dispersion. 2½  
 (d) If the lines of regression of Y on X and X on Y are respectively  $a_1X + b_1Y + c_1 = 0$  and  $a_2X + b_2Y + c_2 = 0$ , then prove that  $a_1b_2 \leq a_2b_1$ . 2½