KNT/KW/16/5095

Bachelor of Science (B.Sc.) Semester—II (C.B.S.) Examination

STATISTICS

(Descriptive Statistics—II)

Compulsory Paper—2

Time : Three Hours] [Maximum Marks : 50

N.B. :— All questions are compulsory and carry equal marks.

1. (A) Describe different averages of a frequency distribution, mentioning their merits and demerits. 10

OR

(E) Prove that :

(i) The sum of deviations about arithmetic mean is zero.

(ii) Sum of squares of deviations about arithmetic mean is the least.

(F) Define weighted arithmetic mean. State its use. Show that it is unaffected if all weights are multiplied by some constant factor. Obtain weighted mean of first n natural numbers with weights as the number itself. 5+5

2. (A) Define moments. State their use. Derive r^{th} central moment in terms of raw moments.

(B) Define Mean Deviation. Prove that mean deviation is the least when the deviations are taken about median. 5+5

OR

(E) Explain the need of relative measures of dispersion. State the absolute and relative measures of dispersion. Describe the merits and demerits of standard deviation and mean deviation. 10

3. (A) Explain the concept of 'Kurtosis' of a frequency distribution. Define Karl Pearson's coefficient of Kurtosis-β_2. Prove that for any frequency distribution β_2 always greater than unity. 10

OR

(E) Explain how ogives are used in locating partition values.

(F) When is a frequency distribution said to be skewed. Illustrate with graphs. Define Karl Pearson's coefficient of skewness. State its limits. 5+5

4. (A) Define Spearman's rank correlation coefficient. Obtain its limits when there is no tie.

   (B) Define correlation coefficient and regression coefficients. State relationship between them. Prove that if one regression coefficient is greater than unity, other must be less than unity.

5+5

OR

   (E) Derive the expression for line of best fit of Y on X by the method of least squares. Explain the effect of change of origin and scale on regression coefficients. 10

5. Attempt any **ten** of the following :

   (A) State empirical relation between Mean, Mode and Median. If Mode of a distribution is 50 and Median is 45 find Mean.

   (B) If 100 is the mean of 7 observations and 50 is the mean of 3 observations find the mean of combined set.

   (C) Greater the difference between the mean and mode, more will be the skewness : comment.

   (D) Which of the following is the positional average ?

   (i) Arithmetic Mean

   (ii) Median

   (iii) Geometric Mean

   (iv) Harmonic Mean.

   Explain.

   (E) Comment on the shape of the distribution with third central moment equal to zero.

   (F) Give a real life example of negatively correlated variables.

   (G) A student computed 1.5 as a correlation coefficient between two variables X and Y. Is it correct ?

   (H) Define coefficient of determination. And explain its use.

   (I) State two drawbacks of range as a measure of dispersion.

   (J) State the suitable measure of dispersion for a frequency distribution with open end classes.

   (K) State R-command for box-plot.

   (L) Explain the Sheppard's correction. 1×10=10