2021

STATISTICS — GENERAL

Paper : GE/CC-1

(Descriptive Statistics)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer **any five** of the following :   2×5

   (a) Distinguish between nominal and ordinal data with examples.

   (b) Compute a suitable measure of central tendency for the data {1, 2, 3, 4, 5, 100}.

   (c) Find the GM of a set of observations for which AM = 2 and SD = 0.

   (d) If for a symmetrical distribution Q_1 = 20, Q_3 = 36, find the median.

   (e) Give an example where quartile deviation is an appropriate measure of dispersion.

   (f) Mention the type of kurtosis of a frequency distribution when b_2 = 1.5.

   (g) When are the two regression lines identical?

   (h) If (3, 7), (5, 5), (7, 3), (2, 8) and (8, 2) are the 5 pairs of observations on two variables (x, y), find the value of r_{xy}.

2. Answer **any two** of the following :   5×2

   (a) For a set of observations show that |Mean – Median| ≤ SD.

   (b) Show that the coefficients of regression are independent of change of origin but depend on change of scale of variables.

   (c) Derive the formula for Spearman's rank correlation coefficient in case of no tie.

3. Answer **any three** of the following :

   (a) Explain, with examples, frequency type and non-frequency type data. What is meant by median of a distribution? How do you obtain the median for a grouped data? If a variable x has median 'm' what will be the median of the variable $y = e^x$?   5+2+2+1

   (b) What do you mean by dispersion of a data set? Suggest a suitable measure of dispersion to compare the heights of two different ethnic groups. Derive a formula for variance based on the mutual difference of the observations.   2+4+4

   (c) Express r-th order central moment in terms of raw moments upto order r. What is meant by skewness of a distribution? Suggest a measure of skewness based on quartiles. Find the limits of this measure.   5+2+1+2

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(d) Applying the least square method derive the regression line of y on x on the basis of n pairs of observations on two variables x and y. If θ is the angle between two regression lines find an expression for θ and interpret the case when $\theta = \pi/2$. 5+5

(e) Give a real life example of trivariate data. What is multiple correlation? Express multiple correlation coefficient in terms of total and partial correlation coefficients for three variables. 2+2+6

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