WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 1st Semester Examination, 2021-22

STSACOR01T-STATISTICS (CC1)

DESCRIPTIVE STATISTICS

Time Allotted: 2 Hours   Full Marks: 40

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.

GROUP-A

Answer any *four* questions from the following   5×4 = 20

1. Describe the merits and demerits of mode.   5

2. What is a frequency curve? Give the description of broad categories of frequency curve.   5

3. If $y = a + bx$ and M_0 is the mode of x, then show that the mode of y must be $a + bM_0$.   5

4. Distinguish between absolute and relative measures of dispersion.   5

5. Prove that the correlation coefficient r lies between −1 and +1.   5

6. Describe different scales of measurement.   5

GROUP-B

Answer any *two* questions from the following   10×2 = 20

7. (a) Suppose that the variable x takes positive values only and that the deviations $x_i - \bar{x}$ are small compared to $\bar{x}$. Show that in such case $x_g \simeq \bar{x}\left(1 - \dfrac{s^2}{2\bar{x}^2}\right)$.   5

   (b) What is Sheppard's correction? What will be the corrections for first four moments?   5

8. (a) Using Cauchy-Schwarz inequality, or otherwise, prove that (i) $b_2 \geq 1$ and (ii) $b_2 - b_1 \geq 1$.   6

  (b) Express central moments in terms of moments about an arbitrary origin A.   4

9. (a) Let x and y be independent variables with standard deviations s_x and s_y. Show that the correlation coefficient between x and $x + y$ is $s_x \big/ \sqrt{s_x^2 + s_y^2}$.   5

  (b) Derive Spearman's formula for rank correlation coefficient.   5

10.(a) Starting the regression lines, show that correlation coefficient is the geometric mean of two regression coefficients and interpret it.   4

  (b) Explain correlation ratio.   6

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within* 1 *hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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