



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours/Programme 1st Semester Examination, 2021-22

STSHGEC01T/STSGCOR01T-STATISTICS (GE1/DSC1)

STATISTICAL METHODS

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. Show that the root mean square deviation is least when it measures about mean. 5
2. For two sets of observations on a variable x , show that the median of the combined set lies between the medians of set 1 and set 2. 5
3. Show that $r_{Yy} = \|r_{xy}\|$, where Y is the estimated value of y from the least square regression line of y on x . 5
4. Out of the two lines of regression given by $x+2y-5=0$ and $2x+3y-8=0$, explain which one is the regression line of x on y . 5
5. What do you mean by independence and association between two attributes? Illustrate. 5
6. Prove that the standard deviation is independent of any change of origin but it is dependent on the change of scale. 5

GROUP-B

Answer any *two* questions from the following

10×2 = 20

7. (a) Sketch scatter diagrams indicating that (i) r_{xy} is positive and (ii) r_{xy} is an inappropriate measure of correlation, r_{xy} being the correlation coefficient between x and y . 3
- (b) Prove that $-1 \leq r_{xy} \leq 1$. Interpret the marginal cases. 3

- (c) Write the formula of Yule's coefficient of association Q_{AB} between two attributes A and B . Interpret the cases $Q_{AB} = -1$ and $Q_{AB} = 0$. 4
8. Define mean deviation MD_A of x about A . Show that MD_A is least when A is the median. Why mean deviation about median is better than range as a measure of dispersion? 2+6+2
9. (a) Find the mean and standard deviation of n natural numbers. 5
 (b) Compare range (R) and standard deviation (s) as measures of dispersion. Prove that $s^2 \leq \frac{R^2}{4}$. 2+3
10. Write short notes on the following: 3+4+3
 (a) Variable and attributes
 (b) The Ogives
 (c) Relative dispersion.

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.

—x—