

WEST BENGAL STATE UNIVERSITY
CBCS General 1st Semester Examinations, 2022
STSHGEC01T/ STSGCOR01T- STATISTICS (GE1/DSC1)
Statistical Methods

Time Alloted: 2 Hours

Full Marks : 40

Answer any *four* questions from the following:

$5 \times 4 = 20$

- (1) Show that the root mean square deviation is least when measures about mean.
- (2) For two sets show that the median of the combined set lies between the median of set 1 and the median of set 2.
- (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 .
- (4) What are central moments? What do you mean by kurtosis? State and interpret a measure of kurtosis.
 $1 + 1.5 + 2.5$
- (5) 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 ?
- (6) What do you mean by independence and association between two attributes? Illustrate.
- (7) Prove that the standard deviation is independent of any change of origin but is dependent on the change of scale.
- (8) Discuss the formula of Yule's coefficient of association Q_{AB} between two attributes A and B . Interpret the cases $Q_{AB} = -1$ and $Q_{AB} = 0$

Answer any *two* from the following questions:

$2 \times 10 = 20$

- (9) i) 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 .
ii) Prove that $-1 \leq r_{xy} \leq 1$. Interpret the marginal cases.
iii) Express r_{uv} in terms of r_{xy} and interpret the expression.
- (10) Define mean deviation MD_A of x about A . Show that MD_A is least when A is the median.
- (11) i) Find the mean and standard deviation of n natural numbers.
ii) Compare range (R) and standard deviation (s) as measures of dispersion. Prove that $s^2 \leq \frac{R^2}{4}$.
 $5 + 2 + 3$
- (12) Write notes on any *two* of the following:
 - i) Variable and attributes
 - ii) The Ogives
 - iii) Relative dispersion