



**WEST BENGAL STATE UNIVERSITY**

B.Sc. Honours/Programme 1st Semester Examination, 2020, held in 2021

**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.*

**Answer any four questions from the following**

5×4 = 20

1. Distinguish between nominal data and ordinal data with examples. 5
2. Discuss independence and association between two attributes. 5
3. If two variables  $x$  and  $z$  are so related that  $z = ax + b$  for each  $x = x_i$  ( $i = 1, 2, \dots, n$ ), where  $a$  and  $b$  are constants then show that  $\bar{z} = a\bar{x} + b$ . 5
4. Show that mean deviation has the minimum value when deviations are taken from the median. 5
5. First and third quartiles of a distribution are 30 and 75. Also its coefficient of skewness is 0.6. Find the median of the distribution. 5
6. Define scatter diagram. If  $x$  and  $y$  are uncorrelated, obtain the correlation between  $(x + y)$  and  $(x - y)$ . 2+3

**Answer any two questions from the following**

10×2 = 20

7. (a) What is kurtosis? How is it measured? 2+2
- (b) Show that for a frequency distribution  $b_2 \geq b_1 + 1$ , where  $b_1$  and  $b_2$  are the coefficient of skewness and kurtosis respectively. 6
8. (a) If  $s_x^2 = 9$ ,  $s_y^2 = 16$  and  $V(X - Y) = s_x^2$ , find the regression co-efficient of  $Y$  on  $X$ . 3
- (b) Prove that  $-1 \leq r_{xy} \leq 1$ . Interpret the equality cases. 4+1

(c) Express  $r_{uv}$  in terms of  $r_{xy}$ , where  $u = \frac{x-a}{b}$ ,  $v = \frac{y-c}{d}$  and  $-\infty < a, c < \infty$ ,  $b, d > 0$ . 2

9. (a) Compare mean, median and mode as measures of central tendency. 5

(b) For  $n$  positive values  $x_1, x_2, \dots, x_n$  of a variable  $x$ , prove that  $AM \geq GM \geq HM$ . 5

10. Distinguish between simple regression and multiple regression. What do you mean by “multiple correlation coefficient”? Considering three variables, express multiple correlation coefficient in terms of simple correlation coefficients. Explain partial correlation coefficient. 2+2+4+2

**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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