

U.G. 1st Semester Examination - 2020**STATISTICS****[HONOURS]****Generic Elective Course (GE)****Course Code : STAT-H-/GE-T-1****(Statistical Method)**Full Marks : 50 (40+10) Time : $2\frac{1}{2}$ Hours*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.**Notations and symbols have their usual meaning.*

1. Answer any **five** questions: $2 \times 5 = 10$
- What are grouped and ungrouped frequency distributions?
 - What are the characteristics of ratio scale?
 - Define Geometric mean and Harmonic mean.
 - Why are variance and standard deviation the most popular measures of variability?
 - Describe the limitations of diagrammatic representation.
 - What must be the values of the fourth moment about the mean in order that the

distribution be leptokurtic, mesokurtic, and platykurtic?

- What is the difference between correlation analysis and regression analysis?
 - How can you measure association between two categorical variables?
2. Answer any **two** questions: $5 \times 2 = 10$
- Write a short note on frequency distribution.
 - Compare mean, median and mode as measures of central tendency of a distribution.
 - What is Sheppard's correction? What will be the corrections for the first four moments?
 - Write down Yule's Coefficient of Association and discuss its Range. State its limitations.
3. Answer any **two** questions: $10 \times 2 = 20$
- Write a note on the use of graphical method in Statistics. Indicate briefly the merits of various kinds of diagrams for the presentation of statistical data.
 - In a frequency table, the upper boundary of each class interval has a constant ratio to the lower boundary. Show that the geometric mean G may be expressed by the formula:

[Turn over]

$$\log G = x_0 + \frac{c}{N} \sum_i f_i (i-1)$$

where x_0 is the logarithm of the mid-value of the first interval and c is the logarithm of the ratio between upper and lower boundaries.

- c) Find the mean deviation from the mean and standard deviation of arithmetical progression $a, a+d, a+2d, \dots, a+2nd$ and verify that the latter is greater than the former.
- d) What is rank correlation? If d_i be the difference in the ranks of the i^{th} individual in two different characteristics, show that the maximum value of $\sum_{i=1}^n d_i^2$ is $\frac{1}{3}(n^3 - n)$. Hence or otherwise, show that rank correlation coefficient lies between -1 and $+1$.

[*Internal Assessment : 10*]
