

U.G. 3rd Semester Examination - 2020**STATISTICS****[HONOURS]****Generic Elective Course (GE)****Course Code : STAT-H-GE-T-1****(Statistical Methods)**

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: 2×5=10
 - a) What are the characteristics of nominal scale?
 - b) What are the characteristics of mean as a measure of central tendency?
 - c) What is the variance for the following discrete data [12, 23, 34, 54, 21, 9, 7]?
 - d) What are left skewed distribution and right skewed distribution?
 - e) What is a Multiple Bar Diagram?
 - f) What are the limitations of regression?

- g) Give a measure of association between two categorical variables.
- h) Mean of 100 observations is 50 and S.D. is 10. What will be the new mean and S.D., if 5 is subtracted from each observation and then it is divided by 4?

2. Answer any **two** questions: 5×2=10
 - a) What is the difference between nominal and ordinal scale?
 - b) Explain primary data and secondary data.
 - c) Explain the difference between product moment correlation coefficient and rank correlation coefficient.
 - d) For the case of a 2×2 contingency table, define complete association and absolute association.
3. Answer any **two** questions: 10×2=20
 - a) If x takes values a, ar, ..., ar^{n-1} then obtain AM, GM, and HM, where $a>0$, $n>4$, $r>1$. Also prove that $(AM)(HM) = (GM)^2$. 6+4
 - b) Define skewness. Show that Pearson's measure of skewness lies between -3 to 3. 3+7

- c) Define standard deviation. Let s and R be respectively the standard deviation and range of a set of n values of x . Show that

$$\frac{R^2}{2n} \leq s^2 \leq \frac{R^2}{4}. \quad 2+8$$

- d) Describe the concept of regression of y on x . How are the regression lines determined? At which point do the two regression lines coincide? 6+2+2

[Internal Assessment: 10]
