



'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 1st Semester Examination, 2022

GE1-P1-STATISTICS

STATISTICAL METHODS

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

GROUP-A

1. Answer any **five** questions from the following: 1×5 = 5
- (a) What is frequency polygon?
 - (b) What do you mean by measure of central tendency?
 - (c) What is raw moments?
 - (d) Calculate the geometric mean of first n natural numbers.
 - (e) Write two merits of mean deviation.
 - (f) What is Kurtosis?
 - (g) What is Standardized Variable?
 - (h) Define co-relation.

GROUP-B

2. Answer any **three** questions from the following: 5×3 = 15
- (a) Calculate the median from the following table:
- | | | | | | |
|------------|------|-------|-------|-------|--------|
| Class: | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 |
| Frequency: | 8 | 15 | 6 | 7 | 5 |
- (b) Prove that standard deviation is Independent of the change of origin but depends on the change of scale.
- (c) Prove that $\frac{m_4}{m_2^2} \geq \frac{m_3^2}{m_2^3}$, where the symbols have their usual meaning.
- (d) Calculate the mean deviation from the mode of the following table:
- | | | | | | |
|----------------|-------|-------|-------|-------|-------|
| Height (inch): | 60-62 | 63-65 | 66-68 | 69-71 | 72-74 |
| Frequency: | 5 | 18 | 42 | 27 | 8 |

- (e) The first three moments of a distribution about the value 3 of the variable are 2, 10 and 30 respectively. Obtain the first three moments about Zero. Show also that the Variance of the distribution is 6.

GROUP-C

3. Answer any *two* questions from the following: 10×2 = 20

- (a) If all the sample values are non-zero positive quantities, then,

$$A.M. \geq G.M. \geq H.M.$$

The sign of equality holds when all the sample values are equal.

- (b) What do you mean by rank and rank correlation? Prove that, $R = 1 - \frac{6\sum d^2}{n(n^2 - 1)}$,

where the symbols have their usual meanings.

- (c) Prove that for a set of observations, Mean deviation is minimum when taken about the Median.

- (d) What do you mean by regression coefficient of x on y ? Prove that the angle between the two regression lines is given by,

$$\theta = \tan^{-1} \left(\frac{1-r^2}{r} \cdot \frac{s_x s_y}{s_x^2 + s_y^2} \right)$$

—x—