SYLHET CADET COLLEGE

PROGRESS TEST EXAMINATION - 2024 | Set | A |
CLASS: HSC
STATISTICS (CREATIVE) **Subject Code:** | 1 | 2 | 9 |
FIRST PAPER
TIME – 2 hours & 35 minutes
FULL MARKS – 50

[**N.B.** – The figures of the right margin indicate full marks. Read the stems carefully and answer the associated questions. Answer any **FIVE** questions taking at least two from each group.]

Group–A

1. **Marks obtained by five studnets in statisics out of 15 were 4, 6, 10, 12, and 15. The examiner said, the square of the sum of the marks is greater than the sum of the squares of the marks.**

   (a) What is finite population? 1

   (b) Explain quantitative variable with an example. 2

   (c) In the light of the available data, find $\sum_{i=1}^{5}(x_i - 2x)^2$ 3

   (d) Verify the comment of the examiner. 4

2. **A system analyst collected frequencies of a signal at different times. Then he realized due to some unknown noise, 0.5 units got added to all the values. The recorded values are given below:**

   10, 12, 15, 14, 12, 16, 20, 16, 18, 11

   (a) What is change of origin? 1

   (b) Does change of origin have an effect on median? 2

   (c) Find $\sum_{i=1}^{10}(X_i - 5)$. 3

   (d) Determine the summation of the values discarding the noise. 4

3. **A shrimp producer wanted to get an insight into his shrimp production. To do so, he randomly collected weights of different shrimps in his farm.**

Weight of shrimp (gm)	10-20	20-30	30-40	40-50	50-60
Frequency	5	8	10	9	4

   (a) What is the primary goal of central tendency? 1

   (b) When is Median a better measure of central tendency than Arithmetic Mean and why? 2

   (c) From the stem, find 3rd quartile and explain. 3

   (d) Find harmonic mean (HM) and compare with the arithmetic mean (AM) 4

4. **There are only two students in a class IX in a college. In half-yearly exam, the arithmetic and the geometric mean of the marks of those two studnets are 25 and 15, respectively.**

   (a) Write down the formula of Geometric Mean for grouped data. 1

   (b) Prove with an example: $\sum_{i=1}^{n}(x_i - \bar{x}) = 0$ 2

   (c) Determine the marks of the students. 3

   (d) Is 20 a possible value of the harmonic mean of this data? Explain theoretically and empirically. 4

Group–B

5. **The first four moments of a dataset were the following:**

   -1, 5, 20, 90

   (a) What is raw moment? 1

   (b) What is the standard deviation of the data in the stem? 2

   (c) Determine the third central moment. 3

   (d) Comment on the kurtosis of the given data. 4

6. **The heights of the trees of a certain species that were planted at around the same time in a park were examined by an analyst, hired by the park authority to check for any abnormality. He randomly observed 10 trees; the values (in cm) obtained are given below:**

200, 190, 185, 210, 220, 200, 205, 207, 230, 195

(a) What is five number summary? 1

(b) Which measures are shown on a Box & Whisker plot? 2

(c) Display the data on a box plot. 3

(d) Taking a look at the box plot, comment on the symmetry of the data. 4