SYLHET CADET COLLEGE

TEST EXAMINATION - 2025 | Set: C
CLASS: XII
STATISTICS (CREATIVE) | **Subject Code:** 1 2 9
FIRST PAPER
TIME – 2 hrs & 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 questions from each group]

1. **The daily website visits (in thousands) for an online platform over seven days are recorded as 80, 85, 90, 95, 100, 105, and 110 (denoted by z). The platform analyst claimed that the square of the total visits is greater than the total of the squared visits.**

   (a) Give an example of an infinite population. 1

   (b) Differentiate between discrete and continuous variable. 2

   (c) Calculate $\sum_{i=1}^{7}(z_i - 2z_i)^2$ using the provided data. 3

   (d) Verify whether the analyst's statement is accurate based on the data. 4

2. **The number of books sold by a bookstore in 20 days is summarized as shown below.**

Books Sold (X)	0	1	2	3	4
Days (Y)	5	7	4	3	1

   (a) What is bivariate data? 1

   (b) Give one example of each scale of measurement. 2

   (c) Find the total number of books sold using a suitable notation. 3

   (d) Verify the statement: $\sum_{i=1}^{5} X_i Y_i = \sum_{i=1}^{5} X_i \times \sum_{i=1}^{5} Y_i$ 4

3. **For two positive non-zero numbers, if $GM = 6\sqrt{3}$ and $AM = 10$, where the symbols represent their usual meanings:**

   (a) what is the relationship among AM, GM, and HM? 1

   (b) Find Arithmetic Mean: $14, 18, 22, \cdots, 70$ 2

   (c) Determine the Harmonic Mean (HM) of the two numbers. 3

   (d) Find the values of the two numbers. 4

4. **The number of hours spent studying per week by students in a school were recorded as follows:**

Hours Studied	**Frequency**
0-5	8
5-10	12
10-15	10
15-20	6
20-25	4

   (a) What is change of origin? 1

   (b) Relate short-cut method of arithmetic mean with change of origin and scale. 2

   (c) Compute the Arithmetic Mean of the given data using the short-cut method. 3

   (d) Compute the Arithmetic Mean with a different value of origin (a). Do both the methods give same result? What is the best choice of a? 4

Group - B

5. **For a given data set representing the monthly salaries (in thousands) of employees in a company, the following statistics are provided: Median = 60, Mode = 55, Standard Deviation = 5, and Coefficient of Variation (CV) = 8.3.**

   (a) How many types of moments are there? 1

   (b) Derive the value of the first central moment. 2

   (c) Calculate the skewness using Pearson's method (SK_P). 3

   (d) Does the value of (SK_P) accurately reflect the nature of the data based on the given statistics? Justify your answer. 4

6. **The annual sales (in million dollars) of a tech company over eight years are provided below:**

Year	2014	2015	2016	2017	2018	2019	2020	2021
Sales	120	150	140	160	180	200	220	240

(a) Write down the additive model of time series. 1

(b) How does semi-average method work? 2

(c) Calculate the trend using the three-yearly moving average method. 3

(d) Predict the approximate sales for the year 2022 using both graphical and moving average methods. 4

7. **The weights of newborn babies (in kilograms) in a hospital over a week were recorded by a pediatrician to monitor their health. The weights of 10 randomly selected babies are given below:**

3.2, 2.9, 3.5, 3.1, 3.4, 3.0, 3.3, 3.6, 2.8, 3.7

(a) Draw a symmetrical distribution. 1

(b) Write three uses of five number summary 2

(c) Represent the data using a Box & Whisker plot. 3

(d) Compare the plot with the five-number summary and comment on the distribution of the data. 4

8. **The role of official statistics in policy-making is crucial for economic and social development. Governments and international organizations rely on accurate data to formulate strategies and monitor progress.**

(a) What is semi-official statistics? 1

(b) Briefly mention what Bangladesh bank does. 2

(c) Discuss the sources of official statistics in Bangladesh and their importance in decision-making. 3

(d) Analyze the limitations of official statistics in Bangladesh and suggest ways to improve their reliability. 4

"The greatest value of a picture is when it forces us to notice what we never expected to see."

– John Tukey.