

SYLHET CADET COLLEGE
PROGRESS TEST EXAMINATION - 2025
CLASS: XII
STATISTICS (CREATIVE)
FIRST PAPER
[According to the Syllabus of 2025]
TIME – 2 hours & 35 minutes
FULL MARKS – 50

Ques Setter	
Moderator	
VP	

Subject Code:

1	2	9
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[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]

Group - A

1. The monthly sales (in thousands of units) recorded by a store over five months are 120, 135, 150, 160, and 175. The store manager stated that the square of the total sales is greater than the total of the squared sales.

- (a) What is change of origin?

1
- (b) If the scores of five students in a test are 78, 85, 92, 88, 95, find $\sum_{i=1}^5 (x_i^2 - 2x_i + 3)$

2
- (c) Calculate $\sum_{i=1}^5 (x_i - 1.5x_i)^2$ using the provided data.

3
- (d) Assess whether the manager’s statement is accurate based on the data.

4

2. The monthly sales and expenses (in thousand BDT) of five retail stores are given below:

Store	A	B	C	D	E
Sales (X)	50	65	40	70	55
Expenses (Y)	30	45	25	50	35

- (a) What is univariate data?

1
- (b) Differentiate between discrete and continuous variable.

2
- (c) Calculate $\sum_{i=1}^5 (x_i + y_i)$

3
- (d) Verify whether the statement $\sum_{i=1}^5 (3x_i - 2y_i) = 3 \sum_{i=1}^5 x_i - 2 \sum_{i=1}^5 y_i$ holds true.

4

3. Average marks of two sections A & B in a statistics exam are 68 and 74 respectively. The overall average mark of both sections combined is 70. Section A has 25 students.

- (a) Does Arithmetic mean depend on change of origin?

1
- (b) Derive the formula of Combined Arithmetic mean.

2
- (c) How many students are there in section B?

3
- (d) Later, it was found that a student in section B was wrongly marked 80 instead of 90. Find the corrected average of section B and the new combined average.

4

4. A meteorologist records the monthly rainfall (in mm) in different regions over a year as shown below:

Rainfall (mm)	0-50	50-100	100-150	150-200	200-250
Frequency	6	10	14	8	7

- (a) Which class contains the Mode?

1
- (b) Find Δ_1 and Δ_2 , where the symbols represent their usual meanings

2
- (c) Find the Mode using the Direct formula.

3
- (d) Find the Mode using histogram and compare with direct method.

4
- Which one do you think is more accurate?

5. A data set represents the test scores of 10 students in a recent exam, recorded as follows:

56, 62, 68, 71, 65, 59, 74, 67, 70, 63

- (a) How many types of moments are there? 1
 - (b) Derive the value of the first central moment. 2
 - (c) Calculate the first four moments about 3. 3
 - (d) Compute the variance and kurtosis of the data using converted central moments. Explain what the kurtosis indicates about the distribution. 4
6. A financial analyst is studying the annual returns (in percentage) of a set of investment portfolios. The following table summarizes the data.

Annual Return (%)	-5 to 0	1-5	6-10	11-15	16-20	21-25
Frequency	3	5	7	6	4	3

- (a) What is negative skewness? 1
 - (b) In a right-skewed distribution, how are Mean, Median, and Mode related? 2
 - (c) Compute the skewness of the data and interpret the nature of the investment returns. 3
 - (d) Determine the kurtosis and explain. 4
7. The monthly sales (in units) of laptops at a major electronics store are recorded below:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Sales	120	150	130	170	160	180	200	210

- (a) Give an example of irregular variation? 1
 - (b) What are the limitations of semi-average method? 2
 - (c) Compute the trend using a three-monthly moving average method. 3
 - (d) Illustrate the trend graphically and estimate the expected laptop sales for September. 4
8. The classification of published statistics is essential for organizing data into meaningful categories. This helps in better understanding and utilization of the data for research and policy-making.
- (a) What is non-official statistics? 1
 - (b) What are the limitations of official statistics? 2
 - (c) Explain the classification system used for published statistics in Bangladesh. 3
 - (d) Evaluate the effectiveness of this classification system in meeting the needs of researchers and policy-makers. 4