

**Sylhet Cadet College**  
**Model Test Examination - 2023**  
**Class: HSC**

**Subject: Statistics First Paper (Creative)**

**Time: 2 hour & 35 minutes**

**Subject Code: 129**

**Full Marks: 50**

Answer FIVE questions taking at least 2 (two) from each group. Figures in the right indicate full marks.

**Group A**

1. **Marks of six studnets in Physics and Chemsitry are as follow:**

Physics (X) : 10, 14, 15, 13, 17, 18 Chemistry (Y) : 18, 16, 13, 10, 9, 14

- (a) Who is the Father of statistics? 1
- (b) Write the steps in a statistical analysis. 2
- (c) Find the largest value:  $\sum x_i^2, \sum y_i^2, (\sum x_i)^2$  3
- (d) Which subject seems easier? Show mathematically using proper notations. 4

2. **A sports analyst collected ages of athelets having ages between 10 and 35. He then presented his findings as below:**

Age	10-15	15-20	20-25	25-30	30-35
No. of Athlete	2	8	10	5	3

- (a) What is central tendency? 1
- (b) When is geometric mean iappropriate to measure? 2
- (c) Compute median from the stem. 3
- (d) Show that Arithmetic mean is greater than Harmonic mean. Which one of them is more suitable for this data? 4

3. **Frequency distribution of marks in statistics of a college is given in the following table.**

Marks	Number of Students	Number of Students
	Group - A	Group - B
25-30	11	10
30-35	18	16
35-40	21	22
40-45	26	28
45-50	14	9

- (a) What is data? 1
- (b) What are the disadvantages of secondary data? 2
- (c) Calculate the arithmetic mean of Group - A 3
- (d) Compute the combined mean. Is it greather than the arithmetic mean of Group - B? Explain the possible reason(s). 4

4. **The arithmetic and geometric means of the first and third quartiles of a distribution are 10 and 8, respectively. The second quartile is 10.**

- (a) What is the formula suggested by Pearson to find skewness? 1
- (b) Which moments are useful in measuring central tendency and dispersion? 2
- (c) Find skewness from the stem using a suitable formula. 3
- (d) Which method of finding skewness od you think is the best and why? 4

## Group B

5. **The first four moments about 3 of a distribution are -1, 5, -10, and 120.**
- (a) What are moments used for? 1
  - (b) Can the second central moment be greater than the third central moment? 2
  - (c) Find the second and third moments about arithmetic mean of the distribution. 3
  - (d) Find skewness and kurtosis and comment on the values. 4
6. **A cyclist moves around a square-shaped lake with the speeds 20, 25, 30, and 16 km per hour.**
- (a) What is grouped data? 1
  - (b) Is arithmetic mean suitable for this data? 2
  - (c) Find the average speed of the cyclist. 3
  - (d) Can we use some other formula for finding the average? Demonstrate. 4
7. **Income of a freelancer in 6 successive months (from Jan to Jun) was found to be 46.0, 49.5, 51.5, 50.6, 56.5, and 60 (in thousands BDT.).**
- (a) What is time series data? 1
  - (b) What are the components of a time series model? 2
  - (c) Determine the 3-monthly moving average from the data. 3
  - (d) Draw the moving averages on a graph paper and interpret. 4
8. **In 2015, tens of thousands of Rohingya people were forcibly displaced from their villages and IDP camps in Rakhine state, Mynmar. Many of them fled to neighboring countries, including Bangladesh, Malaysia, Indonesia. Many national and international agencies collect data on the issue.**
- (a) What is non-official statistics? 1
  - (b) Name five sources of official statistics. 2
  - (c) Shed some light on the limitations of official statistics. 3
  - (d) How can the quality of published statistics in Bangladesh be improved? 4