

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

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

**Time: 2 hour & 35 minutes**

**Subject Code: 130**

**Full Marks: 50**

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

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**Group A**

1. **Height (in inches) of 10 cadets in a class are: 50, 60, 55, 65, 66, 70, 54, 64, 62, 72**
- (a) What is population in statistics? 1
- (b) Is height discrete or continuous? 2
- (c) Find  $\sum_{i=1}^{10} x_i^2$  3
- (d) Find the square of mean and mean of square. Are they equal? 4
2. **For two non-zero positive numbers,  $GM = 4\sqrt{3}$  and  $HM = 6$ , where the quantities bear usual notations**
- (a) When is Harmonic mean suitable? 1
- (b) For two numbers, what is the relationship between AM, GM, and HM? 2
- (c) What is the Arithmetic mean? 3
- (d) Determine the numbers. 4
3. **12 is deducted from each value of a variable and then divided by 3. The new arithmetic mean (AM) is found to be 4.**
- (a) What is change of origin? 1
- (b) Does AM depend on origin? Prove with an example. 2
- (c) From the stem, find the original AM. 3
- (d) Does the origin or the scale have greater impact on AM in this example? 4
4. **In the test examination, marks of 11 students in statistics are: 90, 92, 93, 49, 44, 88, 80, 58, 83, 71, 76.**
- (a) What is central tendency? 1
- (b) When is median better than arithmetic mean? Explain with an example. 2
- (c) Find the 3rd the quartile and 61st percentile from the data and explain. 3
- (d) Do quantiles depend on change of origin and scale. Prove using two examples. 4

**Group B**

5. **Marks obtained by a student in 7 subjects are**
- 70, 66, 55, 45, 80, 30, 82
- (a) What is negative skewness? 1
- (b) Draw graphs of positive and negative skewness showing the locations of mean and median. 2
- (c) Determine the five number summary from the stem and explain. 3
- (d) Are the data symmetric? If not, comment on the pattern of data. 4
6. **Exam marks of two students were summarized for the purpose of comparison. The summary is given below:**

Measure	Student X	Student Y
First Quartile	28	27
Second Quartile	60	60
Third Quartile	75	73
Minimum	16	14
Maximum	89	86

- (a) What is kurtosis? 1
- (b) How much data are contained within Interquartile range? 2
- (c) For student A, estimate the Bowley's Coefficient of skewness and explain. 3
- (d) On the basis of skewness (and hence shape of the data), compare the students. 4
7. **The yearly revenue (in hundred thousand) of shoe manufacturer company is given below**

Year	2005	2006	2007	2008	2009	2010	2011
Revenue	35	22	40	35	50	42	60

- (a) What is general trend? 1
- (b) Which method of determining trend gives only two values? 2

- (c) Determine the trend using three-yearly moving average method. 3
  - (d) Find the trend using graphical method and extrapolate the approximate revenue earned in 2012. 4
8. **Climate change is an alarming problem throught the world. To determine what to do to solve the problem, many government and non-government organizatios collcet and analyze data to come to a consistent solution.**
- (a) What is official statistics? 1
  - (b) What is the role of World Meteorological Organization? 2
  - (c) What are the limitations of published statistics in Bangladesh? 3
  - (d) How can the quality of published statistics in Bangladesh be improved? 4