Sylhet Cadet College
Progress 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 two (2) from each group. Figures in the right indicate full marks.

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 comnparison. 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 throughout 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