Sylhet Cadet College
Progres Test Examination - 2022
Class: HSC
Subject: Statistics First Paper (Creative)
Time: 1 hour & 40 minutes **Subject Code: 129** **Full Marks: 30**

Answer three questions taking at least 1 (one) from each group. Figures in the right indicate full marks.

Group A

1. **Prices and respective profits of some products are collected:**

Price (x)	20	30	25
Profit (y)	4	2	5

    (a) What is a discrete variable?   1

    (b) Can fractional numbers be discrete? Explain briefly.   2

    (c) Are, in the stem, $\sum_{i=1}^{n}\sum_{i=1}^{n} x_i y_j = \sum_{i=1}^{n} x_i y_i$? Show statistically.   3

    (d) Prove empirically that sum of square is greater than square of sum of numbers.   4

2. **In the test examination, marks of 10 students in statistics are 69, 85, 77, 66, 92, 42, 97, 53, 83, 81.**

    (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, 5th septile, and 61st percentile from the data and explain.   3

    (d) Below which mark lie marks of 60% students? Find using two separate quantiles.   4

Group B

3. **Diameter, height, and volume for Black Cherry trees are obtained (from R Database)**

Girth	Height	Volume
8.3	70	10.3
8.6	65	10.3
8.8	63	10.2
10.5	72	16.4
10.7	81	18.8
10.8	83	19.7

    (a) What are moments?   1

    (b) Which moment is equal to the variance? Show mathematically.   2

    (c) Find the first and second raw moments about 2 of volume of the trees.   3

    (d) What do you understand of the possible shape of the data on height and volume of the trees?   4

4. **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-yearly moving average from the data.   3

    (d) Draw the moving averages on a graph paper and interpret.   4