

Sylhet Cadet College
Model 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. Below are some information

$$x_1 = 3, x_2 = 4, x_3 = 1, x_4 = 0$$
$$y_1 = 1, y_2 = 5, y_3 = 0, y_4 = 2$$

- (a) What is a qualitative variable? 1
- (b) Find $\sum_{i=1}^4 x_i^2$ 2
- (c) Prove that $\sum_{i=1}^4 (x_i + y_i) = \sum_{i=1}^4 x_i + \sum_{i=1}^4 y_i$ 3
- (d) Find the value of $\sum_{i=1}^4 x_i y_i - \sum_{i=1}^4 x_i + 4$ 4

2. For a particular data set, Median = 120, Mode = 110, Standard Deviation = 4, and Coefficient of Variation (CV) = 3.2

- (a) Why is CV used? 1
- (b) Find arithmetic mean. 2
- (c) Find skewness according to Pearson's method (SK_P) 3
- (d) Does SK_P convey the proper idea about the data as to the given information? Justify. 4

3. 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

4. Grades of a an undergraduate student with major in statistics are given

Course	Grade	Credit
Probability	3.75	4
Simulation	3.50	3
Calculus	3.50	4
Linear Algebra	3.75	4
Econometrics	3.00	2
Programming	3.50	3

- (a) Write down the formula of weighted mean. 1
- (b) What is difference between weight and frequency? 2
- (c) Determine the GPA of the student. 3
- (d) Determine the geometric mean for the data and evaluate suitability. 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. Goals scored by Karim Benzema in five seasons are recorded to be the following:

Season	La Liga (x)	Uefa Champions League (y)
2017-18	5	5
2018-19	21	4
2019-20	21	5
2020-21	23	6
2021-22	27	15

- (a) What is a quantitative variable? 1
- (b) What is the notation to denote his total number of goals? 2
- (c) Compute $\sum_{i=1}^5 (y_i - 3)^2$ 4
- (d) Find total number of goals using two different notations and examine whether they match. 4

7. Given below is a series of data.

5, 7, 9, \dots , 123

- (a) What is the summation of natural numbers up to nth value? 1
- (b) Find the arithmetic mean of natural numbers from 1 up to 20. 2
- (c) Find the arithmetic mean of the given series. 3
- (d) Prove that arithmetic mean is greater than geometric mean theoretically and empirically. 4

8. In ODI cricket, two top batsmen are (as of 2nd Sept, 2022) Babar Azam and Rassie van der Dussen. Their average (arithmetic mean) scores are 59.79 and 69.32, appearing in 90 (including being not out in 12 occasions) and 33 (including being not out in 11 occasions) matches, respectively.

- (a) When is arithmetic mean inappropriate to use? 1
- (b) Is arithmetic mean always suitable for comparison? 2
- (c) Find the combined arithmetic mean and explain. 3
- (d) How to compare two sets of data having significantly distinct ranges? 4