

SYLHET CADET COLLEGE

TEST EXAMINATION - 2024

CLASS: XII

STATISTICS (CREATIVE)

SECOND PAPER

TIME – 2 hours & 35 minutes

FULL MARKS – 50

Set	C
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Subject Code:	1	3	0
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[**N.B.** – The figures of the right margin indicate full marks. Read the stems carefully and answer the associated questions. Answer any **FIVE** questions taking at least two from each group.]

Group–A

1. **Events that do not depend on each other are called independent events, and events that cannot occur simulataneously are called disjoint events.**

- (a) Provide an example of disjoint events, using the set theory.1
- (b) Prove that $P(A \cap \bar{B}) = P(A) - P(A \cap B)$ 2
- (c) If there are k mutually and exhaustive events, prove $\sum_{i=1}^k P(A_i) = 1$ 3
- (d) Prove that two events cannot be simulataneously independent and mutually exclusive.4

2. **Ratul and Tomal both have an unbiased die. Both have randomly thrown their dice once.**

- (a) What are equally likely events?1
- (b) If a die is thrown once, what is the probability of getting a prime number?2
- (c) From the stem, what is the probability that the sum of numbers appearing on the dice is greater than 6.3
- (d) Examine: the probabilities of getting the sum less than 6 and greater than are equal.4

3. **The probability mass function (pmf) of a football striker scoring no. of hattricks during the course of a league season is given below**

$$P(x) = \frac{|2 - x|}{k}; x = 0, 1, 2, 3, 4, 5$$

- (a) What is a random variable?1
- (b) Is probability a discrete variable? Explain in brief.2
- (c) Find the value of k.3
- (d) Find the probability that the no. of hattricks would be less than the expectation.4

4. **The probability distributions of demand of mobile phones of two operating systems (OS) Android (X) and iPhone OS (iOS) (Y) are:**

Demand	100	200	300	400	500
P(X)	0.1	0.4	m	0.15	0.1
P(Y)	0.09	0.45	0.32	0.11	0.03

- (a) What is Expectation?1
- (b) Can Expectation be negative?2
- (c) Find m from the table.3
- (d) Which OS has higher demand? Analyze.4

Group–B

“We are drowning in information and starving for knowledge.” - *Rutherford David Rogers*