**October 2025**
**B.A./B.Sc.**
**First Semester**
MINOR – 1
**STATISTICS**
*Course Code: STN 1.11*
(Descriptive Statistics & Probability Theory)

*Total Mark: 50*          *Pass Mark: 20*
*Time: 2 hours*

*I. Answer* <u>three</u> *questions, taking* <u>one</u> *from each unit.*

## UNIT–I

1. (a) (Write the correct answer) A smoothed frequency polygon is
     known as      1
     (i) histogram          (ii) frequency curve
     (iii) ogive          (iv) frequency polygon
   (b) Discuss the scope and applications of statistics in any two fields
     of your choice. Mention the methods which are applicable in
     those fields.      5
   (c) Write down the continuous probability distribution for various
     measures of central tendency and dispersion.      6

2. (a) Define continuous random variable and probability density
     function.      3
   (b) Mention the properties of a continuous distribution function.      3
   (c) Discuss the various types of data according to their
     classification.      6

## UNIT–II

3. (a) (Write the correct answer) If the mean of a series is 10 and its
     coefficient of variation is 40 percent, the variance of the series is
     1
     (i) 4      (ii) 8      (iii) 12      (iv) 16

(b) (Write the correct answer) Coefficient of quartile deviation is given by                                          1

(i) $\dfrac{Q_1 - Q_3}{Q_1 + Q_3}$     (ii) $\dfrac{Q_3 - Q_1}{Q_3 + Q_1}$     (iii) $\dfrac{Q_3 + Q_1}{Q_3 - Q_1}$     (iv) $\dfrac{Q_1 + Q_3}{Q_1 - Q_3}$

(c) Prove the mean of the composite series.                    4

(d) Define GM. Show the relationship between AM, GM, and HM
6

4. (a) Write down the characteristics of a good measure of dispersion.
4

(b) Show that SD is independent of change of origin but affected by change of scale.                                          4

(c) Define and write down the formulas of mean deviation (MD) and standard deviation (SD).                              4

## UNIT–III

5. (a) Prove that for any two events A and B we have          2
$$P(A \cap \bar{B}) = P(A) - P(A \cap B)$$

(b) State and prove multiplication theorem of probability.      5

(c) Three newspapers $X$, $Y$ and $Z$ are published in Nagaland. It is estimated from a survey that of the adult population: 20% read $X$, 16% read $Y$, 14% read $Z$, 8% read both $X$ and $Y$, 5% read both $X$ and $Z$, 4% read both $Y$ and Z, 2% read all three. Find what percentage read at least one of the papers.          5

6. (a) Define the following:                                   1×5=5
   (i)   Classical probability
   (ii)  Empirical probability
   (iii) Axiomatic probability
   (iv)  Mutually exclusive event
   (v)   Exhaustive events

(b) A problem in statistics is given to three students $A$, $B$, and $C$ whose chances of solving it are $\dfrac{1}{2}$, $\dfrac{3}{4}$, and $\dfrac{1}{4}$ respectively.

What is the probability that the problem will be solved if all of them try independently?                              5

(c) Can events be mutually exclusive, exhaustive, and independent? Give your reasoning.                                      2

*II. Answer* <u>any two</u> *of the following questions.*

7.  (a)  Define the term statistics in plural as well as singular sense.  3
    (b)  Discuss the components of a table.  4

8.  (a)  Explain the properties of an ideal average. In light of these properties, state which average you think is the best.  4
    (b)  Define kurtosis. Discuss how the kurtosis of a distribution can be measured.  3

9.  (a)  State and prove law of addition of probability.  5
    (b)  Explain an event with examples.  2

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