

Total Time: 3:00 Hours

Total Marks: 75

Note: There are three sections in this paper i.e. A, B & C.

MRD-13th (STAT-1-2025)

STATISTICS Paper-I (Part-II)

VERSION : A

- Instructions:
- Please attempt Section-A on the **MCQs Answer Sheet** only.
 - Only black ball point or marker may be used for shading the relevant circle.
 - Please make sure that there is no cutting, over writing, smearing, or multiple circles shading.

Time Allowed: 20 Minutes

"Section-A"

Marks: 15

Q.1. Choose the correct option i.e. A, B, C or D.

- The probability of an event A lies between:
(A) -1 and +1 (B) -1 and 0 (C) 0 and 1 (D) +1 and -1
- $P(A) + P(\bar{A})$ is equal to:
(A) 0 (B) ∞ (C) 1 (D) 0.5
- If $f(x) = kx$, $0 < x < 1$, then value of k is:
(A) $\frac{1}{3}$ (B) 2 (C) $\frac{1}{2}$ (D) 1
- If X and Y are independent random variables then $v(x-y) =$
(A) $v(x) - v(y)$ (B) $v(x) + v(y)$ (C) $v(x)v(y)$ (D) $v(x+y)$
- The mean of the Binomial distribution is:
(A) $\sqrt{np}$ (B) npq (C) np (D) $\sqrt{npq}$
- Hypergeometric probability distribution has parameters.
(A) 2 (B) 3 (C) 4 (D) 5
- If x is a uniform variable over the interval (5,10) then the mean of x is:
(A) 5 (B) 7.5 (C) 10 (D) 15
- The total area under a Normal distribution curve to the left of the mean is always equal to:
(A) 1 (B) 0 (C) 0.5 (D) 0.9
- A characteristic of population is called:
(A) Parameter (B) Statistic (C) Sample (D) Constant
- An estimator is a:
(A) Variable (B) Constant (C) Fixed value (D) Random value
- If $\hat{p} = 0.5$, then 0.5 is called:
(A) Estimator (B) Estimate (C) Interval (D) All of above
- Estimation has _____ types.
(A) 3 (B) 4 (C) 2 (D) 5
- The range of Yule's coefficient of association is:
(A) 0 to ∞ (B) $-\infty$ to 0 (C) 0 to 1 (D) -1 to +1
- An experimental design is:
(A) An architect (B) A map (C) a plan of experiment (D) All of the above
- Experimental error is due to:
(A) Variation in treatment effects (B) Extraneous factors (C) Experimenter's mistake (D) Lack of experience

Q.2. Attempt any TEN (10) of the following parts. All parts carry equal marks.**Marks:40**

(i) A fair coin is tossed twice. What is the probability that exactly one head occurs?

(ii) Define equally likely events, compound events and exhaustive events?

(iii) A random variable has the following probability distribution:

(iv) Write some of important properties of mathematical expectation.

X	4	6	7	10
P(x)	0.2	0.4	C	0.1

(i) Find the value of C (ii) $P(x < 7)$

(v) Define (i) Bernoulli experiment

(ii) Bernoulli random variable.

(vi) Is it possible to have binomial distribution with mean = 5 and standard deviation = 3?

(vii) Write the properties of Normal distribution?

(viii) A Normal distribution has mean = 100 and variance = 225. Find the $P[x \geq 76]$?

(ix) What is meant by population, sample and sampling?

(x) Differentiate between type I and type-II errors?

(xi) Distinguish between associations and correlation?

(xii) Describe the design of an experiment in your own words?

(xiii) Define a contingency table.

"Section-C"**Marks: 20****Note: - Answer any TWO (2) questions. All questions carry equal marks.****Q.3. A discrete random variable has the probability mass function:**

$$f(x) = \frac{3c_x}{8}, x = 0, 1, 2, 3$$

0, else where

Find (i) $P(X=2)$ (ii) $P(X>1)$ (iii) $P(0 < X < 3)$ **Q.4. For a population with a mean of $\mu=40$ and a standard deviation of $\sigma = 8$. Find the Z-score corresponding to a sample mean of $\bar{x} = 44$ for each of the following sample size? (i) $n=4$ (ii) $n=16$** **Q.5. Let $\bar{x} = 15$ be the mean of a random sample of 64 observations drawn from a normal population whose variance is 100. Test $H_0: \mu = 12$ Vs $H_1: \mu > 12$ at 5% level of significance?**