

PART-II

Time: 2 Hours 40 Minutes

SECTION-B

Marks: 36

1. Attempt any nine of the following short questions. Each question carries 4 marks
- Find the values of (i) ${}^6P_7$ (ii) ${}^{25}P_3$ (iii) ${}^{24}C_4$ (iv) ${}^8C_4$
 - Differentiate between probability and conditional probability
 - From a pack of 52 cards, two cards are drawn randomly. What is the probability that they are king?
 - Define p.d.f and state its properties.
 - Find probability distribution for a number of heads when 2 balanced coins are tossed.
 - Find mean of discrete uniform distribution.
 - If a binomial distribution has mean 3 and variance 2. Find $P(X \leq 5)$
 - Write down the properties of normal distribution.
 - Discuss the advantages of sampling.
 - If $n = 50$, $\sum x = 2163$, $\sum x^2 = 144949.6$. Compute 99% confidence interval for μ .
 - Distinguish between associations and correlation.

SECTION-C

Marks: 24

NOTE: Attempt any three of the following questions. Each question carries 8 marks.

- A normal distribution has mean = 46 and S.D = 4. Compute: i. $P[X > 50]$ ii. $P[X < 38]$
iii. $P[45 \leq X \leq 49]$
- A finite population consists of the numbers 2, 2, 4, 6, 5. Select possible random sample of size $n=2$ without replacement and find their means. Construct the sampling distribution of sample mean and verify that $\mu_{\bar{X}} = \mu$ and $\sigma_{\bar{X}} = \frac{\sigma}{\sqrt{n}} \sqrt{\frac{N-n}{N-1}}$
- A random sample of size 10 is drawn from a normal population given $\bar{X} = 20$ and $s^2 = 16$. Test the hypothesis $H_0: \mu = 19.6$ against $H_1: \mu > 19.6$ at $\alpha = 0.05$
- A discrete random variable has the probability mass function: $f(x) = \frac{C}{8}$, $x = 0, 1, 2, 3$
Find i. $P(X=2)$ ii. $P(X>1)$ iii. $P(0 < X < 3)$