



Date: 15-11-2024

Dept. No.

Max. : 100 Marks

Time: 09:00 am-12:00 pm

SECTION A

Answer ANY FOUR of the following

4 x 10 = 40 Marks

1. Explain discrete and continuous random variables with suitable example.
2. Ten coins are thrown simultaneously. Find the probability of getting
 - (i) atleast seven heads. (ii) Atmost six tails
3. Derive the mean and variance of Geometric Distribution.
4. a) Discuss the differentiate between ‘Correlation and ‘Regression’ (6)
 b) Define Uniform Distribution. and obtain its m.g.f (4)
5. In a Binomial distribution with parameters $n = 5$, $p = 0.3$. Find the probability of getting
 - (i) atleast 3 success, (ii) atmost 3 success and (iii) exactly 3 failures.
6. Let X be normally distributed with mean 8 and standard deviation 4. Find $P(5 \leq X \leq 10)$ and $P(10 \leq X \leq 15)$
7. Derive the mean and variance of the Normal Distribution.
8. A simple random sample of size 100 has mean 15, the population variance being 25.
 Find an interval estimate of the population mean with a confidence level of i) 95% and (ii) 99%.

SECTION B

Answer ANY THREE of the following

3 x 20 = 60 Marks

9. A random variable X has the following probability distribution:
 Determine (i) k (ii) $P(X < 3)$ (iii) $P(X \geq 6)$ and (iv) $P(0 < X < 5)$

X	0	1	2	3	4	5	6	7
$P(x)$	0	K	$2k$	$2k$	$3k$	K^2	$2K^2$	$7K^2+k$

10. State and prove Central limit theorem.
11. (i) Derive the mean and variance of the Poisson distribution
 (ii) Derive mean and variance of Binomial Distribution
12. State and prove Chebyshev’s inequality and state its use.
13. Calculate Karl Pearson’s coefficient of correlation from the following data.

Marks in Economics	48	35	17	23	47
Marks in Commerce	45	20	40	25	45

14. a) Given a normal curve with mean 25.3 and standard deviation 8.1, find the area under the curve between 20.6 and 29.1
 b) Obtain two regression lines from the following data $n = 20$, $\Sigma X = 80$, $\Sigma Y = 40$, $\Sigma X^2 = 1680$, $\Sigma Y^2 = 320$, $\Sigma XY = 480$.

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