

23U308

(Pages: 2)

Name:

Reg.No:

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U STA3 C03 - PROBABILITY DISTRIBUTIONS AND SAMPLING THEORY

(Statistics - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer **all** questions. Each question carries 2 marks.

1. What are the properties of Poisson distribution?
2. Define Negative binomial distribution.
3. Obtain the mean of Normal distribution.
4. Explain Gamma distribution.
5. Explain Pareto distribution.
6. Define sequence of random variables.
7. What are the assumptions of Central limit theorem(CLT).
8. What are reasons for the occurrence of non-sampling error?
9. Define statistic. Give any two example.
10. A random sample of size 225 are drawn from a normal population with mean 100 and standard deviation 20. Find the mean and variance of sample mean .
11. If $\chi^2 \sim \chi^2_{(10)}$. Find (a) $E(\chi^2)$ (b) $M_{\chi^2}(t)$
12. Define student's t distribution.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer **all** questions. Each question carries 5 marks.

13. Obtain the mean of Binomial distribution.
14. Derive the mean and variance of geometric distribution.
15. Obtain the mgf of exponential distribution and hence find its mean and variance.
16. Find the least value of probability $P(1 \leq X \leq 7)$ where X is a random variable with $E(X) = 4$ and $V(X) = 4$.

17. Explain any two types of probability random sampling.
18. State the mean and mode of F distribution. Hence discuss its nature of probability curve of it.
19. State the relationship between normal, Chi-square, t and F distributions.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. State and prove Bernoulli's law of large numbers.
21. For large 'n', show that chi-square distribution approximately normally distributed.

(1 × 10 = 10 Marks)
