

20U308

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Name:

Reg. No:

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2021

(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. Comment on the statement "the mean of a binomial distribution is 3 and variance is 4"
2. Define convergence in probability.
3. Obtain the mean of Uniform distribution(discrete type).
4. Define Gamma distribution.
5. Define Cauchy distribution.
6. Distinguish between parameter and statistic.
7. State Bernoulli's law of large numbers.
8. Distinguish between census and sampling.
9. Define standard error.
10. Define central limit theorem.
11. State the additive property of chi-square distribution.
12. Let $X_i, i = 1, 2, \dots, 6$ be i.i.d $N(0, 1)$ variates and $U = \frac{X_1^2 + X_4^2 + X_3^2}{X_2^2 + X_5^2 + X_6^2}$. Find the distribution of U . Define F-distribution.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. State and prove recurrence relation of central moments of binomial distribution.
14. Establish the lack of memory property of exponential distribution.
15. Explain the properties of normal distribution.
16. Explain simple random sampling.
17. What is questionnaire? Explain the main points to be taken into account while preparing a questionnaire.
18. Derive the distribution of sample mean \bar{X} .
19. Define student t-distribution. Show that all the odd central moments of t-distribution is zero.

Ceiling: 30 Marks

Part C (Essay questions)

Answer any *one* question. The question carries 2 marks.

20. State and prove Chebyshev's inequality.
21. Derive the probability density function of chi-square distribution.

(1 × 10 = 10 Marks)
