19U307 (Pages: 2) Name: ....

Reg.No: ....

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2020

(CBCSS - UG)

CC19U STA3 C03 - PROBABILITY DISTRIBUTIONS AND SAMPLING THEORY

(Statistics - Complementary Course)

(2019 Admission - Regular)

Time : 2.00 Hours Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

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

1. In 10 throws of a biased coin mean number of heads obtained was 2.5. What is the variance of number of heads?
2. Define Poisson distribution.
3. Define rectancular distribution.
4. A random variable X taking values 0, 1, 2, 3 ..... follows geometric distribution with $p = \frac{1}{3}$ What is $E(X)$?
5. Define Cauchy distribution .
6. If χ^2 follows Chi square distribution mean 12 what is its mode?
7. State Bernoulli's law of large numbers.
8. Explain the term sampling distribution.
9. If F foloows $F \sim (n_1, n_2)$, find the distribution of $\frac{1}{F}$
10. A random variable X follows normal distribution with mean 25 and variance 16. What is $P(20 \leq X \leq 30)$
11. If $Y \sim \chi^2_5$, find variance of Y.
12. What is stratified sampling?

(Ceiling: 20 Marks)

Part B (Short essay questions)

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

13. Obtain the mean and variance of binomial distribution.

14. Explain the ' lack of memory property ' of exponential distribution.

15. For the normal distribution ,find the mean deviation from mean.

16. Let $X_1, X_2, \ldots\ldots X_n$ be a set of random variables representing a sample from a normal population with mean μ and finite variance σ^2. Derive the sampling distribution of sample mean.

17. What are merits and demerits of sample survey?

18. Derive the mean and variance of rectangular distribution.

19. Define student t distribution. Show that all the central moments of t distribution are zero.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any ***one*** question. Each question carries 5 marks.

20. State and prove Lindberg-Levy Central limit theorem.

21. Derive a recurrence formula for centrel moments of Poisson distribution and hence obtain measure of kurtosis.

(1 × 10 = 10 Marks)

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