22U469 (Pages: 2) Name: .....

Reg.No: .....

FOURTH SEMESTER B.Voc. DEGREE EXAMINATION, APRIL 2024

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC21U SDC4 PD11 - PROBABILITY DISTRIBUTIONS AND SAMPLING THEORY

(Information Technology - Skill Component Course)

(2021 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. Explain point binomial distribution.
2. Recall the M.G.F of normal dsitribution.
3. Explain exponential distribution.
4. Find the mean of beta distribution of second kind.
5. State Bernoulli's weak law of large numbers.
6. State Central Limit Theorem.
7. Define sampling frame.
8. Describe Questionnaire.
9. Define sampling error.
10. Discuss about parameter and give an example.
11. Find the relation between mean and variance of chisquare distribution.
12. Indentify the distribution of the sqaure of t-variate.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. If X is a poisson variate with parameter λ and Y is another discrete random variable whose conditional probability is given by $P[Y=r|X=x]=\binom{x}{r}p^r(1-p)^{x-r}, 0<p<1, r=0,1,2...x$ then show that the condional distribution of Y is a poisson distribution with parameter λ_p
14. Explain Geometric distribution and hence obtain its mean and variance.
15. Given that the p.d.f $f(x)=2^{-x}, x=1,2,3...$ obtain the M.G.F and hence find its mean.

16. Explain the concept of convergence in probability.

17. For a Geometric distribution $f(x) = 2^{-x}, x = 1, 2, 3, \ldots$. Prove that chebychev's inequality gives $p(|X - 2| \leq 2) > 1/2$ while actual probability is 15/16.

18. Explain cluster sampling.

19. A sample size 10 is taken from a normal distribution with mean 5 and S.D is 2. Write down the distribution of its mean.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. Recall the principles of sampling.

21. i) Discuss about the distribution of square of a 't' statistic with (n-1) degrees of freedom.
    ii) Discuss about the distribution ratio of two chi-square variate.

(1 × 10 = 10 Marks)

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