

21U473

(Pages: 2)

Name: .....

Reg.No: .....

**FOURTH SEMESTER B.Voc. DEGREE EXAMINATION, APRIL 2023**

(CBCSS - UG)

**CC21U SDC4 PD11 - PROBABILITY DISTRIBUTIONS AND SAMPLING THEORY**

(Information Technology - Skill Component Course)

(2021 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. Quote the condition under which binomial distribution tends to poisson distribution.
2. Recall the lack of memory property of a discrete random variable.
3. Discuss the approximate relationship between Q.D and S.D of normal distribution.
4. Determine the mean of beta distribution of first kind.
5. Explain the term Convergence in probability.
6. Discuss Central Limit Theorem.
7. Discuss the limitations of sampling.
8. List the advantages of census over sampling.
9. Describe sampling error.
10. Interpret standard error.
11. Find the relation between mean and variance of chisquare distribution.
12. Summarize the characteristics of t- distribution.

**(Ceiling: 20 Marks)**

**Part B** (Short essay questions - Paragraph)

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

13. Derive the mode of Poisson distribution.
14. Write down the probability function of a normal variate.
  - i) With mean 20 and standard deviation 4.
  - ii) With mean 0 and standard deviation 64.
15. Obtain the M.G.F of Exponential distribution.

16. Let  $(x_n, n \geq 1)$  be a sequence of i.i.d poisson r.v's with mean  $\lambda$ . Obtain the limiting distribution of  $\sum_{i=1}^n X_i$  with the help of Central Limit theorem.
17. State and prove Bernoulli's weak law of large numbers.
18. List advantages and disadvantages of stratified random sampling.
19. Establish the relationship between t and F distributions.

**(Ceiling: 30 Marks)**

**Part C (Essay questions)**

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

20. Explain the principles of sampling.
21. Obtain the sampling distribution of sampling variance.

**(1 × 10 = 10 Marks)**

\*\*\*\*\*