



Reg. No. : .....

Name : .....

II Year B.Sc. Degree (S.D.E. – Supplementary) Examination, April 2023  
(2011 Admission Onwards)

COMPLEMENTARY COURSE IN STATISTICS

SDE 2C02 STA : Probability Distribution and Statistical Inference

Time : 3 Hours

Max. Weightage : 30

**Instruction :** Use of calculators and Statistical tables are **permitted**.

PART – A

Answer **all** questions.

- I. 1. If  $X \sim B(n, p)$  what is the mean of the distribution ?
- 2. If  $X$  and  $Y$  are independent  $E(X/Y) =$
- 3. State true or false : The mean of Binomial distribution is always less than or equal to its variance.
- 4. The range of Beta distribution of Type 1 is \_\_\_\_\_ (Weightage 1)
- II. 5. The square of an independent standard normal variable follows \_\_\_\_\_ distribution.
- 6. If the estimate 't' is unbiased for the parameter  $\theta$  then  $E(t) =$
- 7. What is Type 2 error in testing of hypothesis ?
- 8. The area of acceptance in testing of hypothesis is called \_\_\_\_\_ (Weightage 1)

PART – B

Answer **any eight** questions, weightage **one each**.

- 9. Write the properties of expectation.
- 10. Explain raw moments and central moments.
- 11. What do you mean by a consistent estimate of a parameter ?

P.T.O.



PART – D

Answer **any two** questions, weightage **4 each**.

- 12. Explain the level of significance.
- 13. What is the mean and variance of the Chi-square distribution ?
- 14. Explain the test procedure of testing the population mean, if samples are drawn from Normal Distribution with known variance and  $n > 30$ .
- 15. Explain Exponential distribution.
- 16. State weak law of large numbers.
- 17. What are the properties of a good estimate ?

PART – C

Answer **any six** questions, weightage **2 each**.

- 18. Find the moment generating function of Normal distribution.
- 19. Find the maximum likelihood estimate of the parameter  $\mu$  of Normal distribution.
- 20. Establish Tchebychev's inequality.
- 21. S.T. the sample mean is consistent estimate for population mean of Poisson distribution.
- 22. Explain the test procedure for testing the equality of two population means with unknown population variance in small sample set.
- 23. Explain the relationship between Chi-square, Student's t and F statistics.
- 24. Explain Type 1 error, Power of a test, Confidence coefficient and Critical region.
- 25. If the mean = 12 and SD = 2 for  $X \sim B(n, p)$  find the parameters  $n$  and  $p$ .
- 26. Describe correlation coefficient and its properties.



- 27. Explain the properties of Normal distribution. If  $X \sim N(12, 4)$  find
  - i)  $P(X < 20)$
  - ii)  $P(0 < X < 24)$
  - iii)  $P(|X - 12| > 8)$
- 28. If  $f(x, y) = 2 - x - y, 0 \leq X \leq 1, 0 \leq Y \leq 1$ . Find  $E(X), E(Y)$  and  $SD(X)$ .
- 29. Explain the properties of a good estimate and write an example for each property.
- 30. Find the moment generating function of Poisson distribution and hence find the mean and second central moment.