



QP CODE: 25802567



25802567

Reg No :

Name :

INTEGRATED MSC DEGREE EXAMINATION, MAY 2025

Fourth Semester

INTEGRATED MSC COMPUTER SCIENCE-DATA SCIENCE

**COMPLEMENTARY - ICSD4CM2 - PROBABILITY DISTRIBUTIONS AND
STATISTICAL INFERENCE**

2021 Admission Onwards

3C1FE0DA

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Obtain the variance of the Degenerate Distribution.
2. Obtain the variance of the Bernoulli Distribution.
3. State the memoryless property of Geometric Distribution.
4. Obtain the variance of Continuous Uniform Distribution.
5. Define Laplace Distribution.
6. Define Statistical Inference.
7. Define Point Estimation.
8. Define Confidence Interval.
9. Define Statistical Hypothesis.
10. Explain Randomization.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Explain any 5 properties of Negative binomial Distribution.
12. What are the assumptions underlying the multinomial Distribution?
13. Obtain the Characteristic function of standard cauchy Distribution.





14. Define F statistic. What is its p.d.f? Explain two important uses of it in statistical analysis.
15. Write down the relation between t , chi-square and F distributions.
16. x_1, x_2, x_3 are three independent observations from a population with mean μ and standard deviation σ . If $t_1 = \frac{x_1 + x_2 + x_3}{\sigma}$ and $t_2 = \frac{2x_1 + 3x_2 - 4x_3}{\sigma}$. compare the efficiencies of t_1 and t_2 .
17. The records of a certain hospital showed the birth of 723 males and 617 females in a certain week. Do these conform to the hypothesis that the sexes are born in equal proportions($\alpha=0.05$)
18. Explain the procedure of chi-square test of goodness of fit.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. If 8 coins were tossed 256 times. (a) Find out the expected frequency. (b) Find mean and standard deviation.
20. If X is a normal variate with mean 20 and standard deviation 5. Find the probability that (a) $X \geq 23$ (b) $X < 20$ (c) $16 < X < 22$ (d) $|X - 20| < 5$
21. A medical study showed 57 of 300 persons failed to recover from a particular diseases. Find 95% confidence interval for mortality ratio.
22. A random sample of size 16 has 53 as the mean and the sum of squares of the deviations taken from the mean is 150. Can the sample be regarded as arisen from the population with mean 56.

(2×5=10 weightage)

