

**CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS**

**II-B.TECH-I-Semester End Examinations (Supply) - June- 2025
COMPUTER ORIENTED STATISTICAL METHODS
(CSD)**

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A**(20 Marks)**

1. a) Define conditional probability? [2M]
- b) Define discrete probability function and continuous probability function. [2M]
- c) Define Uniform distribution. [2M]
- d) Define Poisson distribution. [2M]
- e) Define Normal distribution. [2M]
- f) State Central limit theorem. [2M]
- g) Write about one tailed & two tailed tests. [2M]
- h) Write about type-I error and type-II error? [2M]
- i) Define Markov chain with example. [2M]
- j) State n-step transition probabilities. [2M]

PART-B**(50 Marks)**

2. State and prove Baye's theorem. [10M]
- OR**
3. For the continuous probability function $f(x)=kx^2e^{-x}$ when $x \geq 0$ find (i) k (ii) mean (iii) variance. [10M]
 4. The joint p .d. f. of the random variable (X,Y) is $f(x, y)=3(x + y)$ $0 \leq x \leq 1, 0 \leq y \leq 1, x + y = 1$. Find Cov (X,Y) [10M]
- OR**
5. State Chebyshev 's theorem? Fit a binomial frequency distribution for the following data [10M]

x	0	1	2	3	4	5
f	2	14	20	34	22	8

6. Define Normal distribution? In a normal distribution exactly 7% of the items are under 35 and 89% are under 63. What are the mean and S.D of the distribution? [10M]

OR

7. Two independent samples of 8 & 7 items are given below. Is the difference between the means of the sample significant? ($t_{\text{tab}} = 2.16$) [10M]

Sample 1	11	11	13	11	15	9	12	14
Sample 2	9	11	10	13	9	8	10	-

8. Write the procedure for test of hypothesis? A die is tossed 256 times and it turns up with an even digit 150 times. Is the die biased? [10M]

OR

9. In two large populations, there are 30% and 25% respectively of fair haired people. Is this difference likely to be hidden in samples of 1200 and 900 respectively from the two populations? [10M]

10. A housewife buys 3 kinds of cereals A, B and C. She never buys the same cereal in successive weeks. If she buys cereals A, the next week she buys B. However, if she buys B or C, the next week she is 3 times as likely to buy A as the other cereal. In the long run, how often does she buy each of the three cereals? [10M]

OR

11. Three boys A, B, C are throwing a ball to each other. A always throws the ball to B and B always throws the ball to C, but C is just as likely to throw the ball to B as to A. Show that the process is Markovian. Find the transition matrix and classify the states. [10M]
