Code No.: R22MA402BS	R22	H.T.No.			8	R						

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–II–Semester End Examinations (Regular) -June- 2025
COMPUTER ORIENTED STATISTICAL METHODS
(CSE)

[Time: 3 Hours] **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 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 **(10 Marks)**

1. a) Define the axioms of Probability function. [1M]
b) Write the mean and variance of the Discrete Random Variable [1M]
c) Define Poisson distribution. [1M]
d) Define central limit Theorem. [1M]
e) Define interval Estimation. [1M]
f) Discuss about Type-I and Type-II Errors. [1M]
g) Write the formula for the test statistic of single mean. [1M]
h) Define the contingency table. [1M]
i) Define transition probability matrix. [1M]
j) What is a steady-state probability distribution? [1M]

PART-B **(50 Marks)**

2.a) Determine (i) P $(\frac{B}{A})$ (ii) P $(\frac{A}{B^c})$ if A, B are two events with P(A) = $\frac{1}{3}$, P(B) = $\frac{1}{4}$, P(AUB) = $\frac{1}{2}$. [5M]

b) Two cards are drawn from a pack of 52 cards. Find the probability that they are both aces if first card is (i) replaced (ii) not replaced [5M]

OR

3. Two dice are thrown. Let X assign to each point (a,b) in S the maximum of its numbers i.e.,X(a,b)=max.(a,b). Find the probability distribution. X is a random variable with X(s) = {1,2,3,4,5,6}. Also find the mean and variance of the distribution. [10M]

4. Out of 800 families with 4 children each, how many families would be expected to have (i) 3 boys ii) 5 girls iii) either 2 or 3 boys iv) at least one boy. Assume equal probabilities for boys and girls [10M]

OR

5. In a Normal distribution, 7% of the items are under 35 and 89% are under 63. Determine the mean and variance of the distribution. [10M]

6. Let p be the probability that a coin will fall head in a single toss in order to test $H_0: p = 0.5$ against H_1: $p \neq 0.5$. Test the hypothesis at 0.05 level of significance. [10M]

OR

7.a) It is climbed that a random sample of 100 tyres with a mean life of 15269km is drawn from population it has a mean life of 15200 and S.D of 1248. Test the validity of this climb. [5M]

b) Write about the Test of Hypothesis for single proportion and difference of proportions. [5M]

8. A random sample of 10 boys had the following I.Q's: 70, 120, 110, 101, 88, 83, 95, 98, 107 and 100. [10M]

i) Do these data support the assumption of a population mean I.Q of 100?

ii) Find a reasonable range in which most of the I.Q, values of samples of 10 boys lie.

OR

9. From the following data find whether there is any significant liking in the habit of taking soft drinks among the categories of employees. [10M]

Employees			
Soft Drinks	Clerks	Teachers	Officers
Pepsi	10	25	65
Thums up	15	30	65
Fanta	50	60	30

10. A fair dice is tossed repeatedly. If Xn denotes the maximum of the numbers occurring in the first n tosses, find the transition probability matrix p of the Markov chain {Xn}. Also find $P\{X_2 = 6\}$ and P^2. [10M]

OR

11. Classification of states of a Markov chain and give the example. [10M]

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