Code No.: MA302BS | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–I–Semester End Examinations (Supply) - February- 2024
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) State additive Rule? [2M]
   b) Write about Discrete Probability distributions and Continuous Probability distributions. [2M]
   c) State Chebyshev's theorem. [2M]
   d) Find the mean of Exponential distribution. [2M]
   e) Write about Sampling Distribution? [2M]
   f) Define Exponential distribution? [2M]
   g) Define test of Hypothesis? [2M]
   h) Write about Standard Error of a Statistic? [2M]
   i) Write about Stochastic processes? [2M]
   j) Define Markov chain? [2M]

PART-B **(50 Marks)**

2. Write Conditional probability? State and prove Baye's theorem. [10M]

OR

3. A random variable X has the following probability function: [10M]

X	0	1	2	3	4	5	6	7
P(X)	0	K	2K	2K	3K	K^2	$2K^2$	$7K^2+K$

Find the value of k and Evaluate $P(X < 6)$, $P(X \geq 6)$, $P(0 < X < 5)$.

4. The joint probability function(x,y)is given by p(x,y)=k(2x+3y)where x=0,1,2 and y=1,2,3 [10M]
   i. Find the Marginal distribution.
   ii. Find the conditional distribution of x/y.

OR

5. Define Poisson distribution? Fit a Poisson distribution for the following data. [10M]

x	0	1	2	3	4
f	109	65	22	3	1

6. Define Normal distribution? In a normal distribution, 31% of the items are under 45 and 8% are over 64. Find the mean and standard deviation of the distribution. [10M]

OR

7. The heights of 10 males of a given locality are found to be 70,67,62,68,61,68,70,64,64,66 inches. Is it reasonable to believe that the average height is greater than 64 inches? Test at 5% level and 9 is degrees of freedom (t=1.833 at 0.05). [10M]

8. Write about one tailed and two tailed tests? A sample of 900 members has a mean of 3.4 cms and S.D 2.61cms.Is the sample from a large population of mean 3.25 cm and S.D 2.61 cms. If the population is normal and its mean is known find the 95%confidential limits of true mean. [10M]

OR

9. Write about null hypothesis and alternative hypothesis? A die thrown 9000 times and of these 3220 yielded a 3 or 4 .Is this consistent with the hypothesis that the die was unbiased? [10M]

10. Two boys B_1, B_2 and two girls G_1, G_2 are throwing a ball from one to other. Each boy throws the ball to other boy with probability ½ and to each girl with probability 1/4. On the other hand each girl throws the girl throws the ball to each boy with probability ½ and never to other girl. In the long run how often does each received the ball? [10M]

OR

11. Define Stochastic Matrix and Regular Matrix. [10M]
Which of the following matrices are regular matrices.

$$\begin{pmatrix} 0 & 0 & 1 \\ 1/2 & 0 & 1/2 \\ 0 & 1 & 0 \end{pmatrix} \text{ and } \begin{pmatrix} 1/2 & 1/4 & 1 \\ 0 & 1/2 & 1 \\ 0 & 0 & 1 \end{pmatrix}$$

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