Academic Year 2022-2023 (EVEN Semester)

USN: _____

Department of Artificial Intelligence and Machine Learning

Course Code: 21AI41 Date: 19-Sept-2023
Sem: IV Duration: 110 Minutes

MAKEUP TEST

Statistics for Data Science

Answer all the Questions

SL. No	Questions	M	BT	CO
1	a. Assume you have rolled a fair six sided die 5 times and in all the five times the result was 4. Compute the probability of getting a 4 in the sixth trial also. Recall that for a fair six-sided die, the probability of getting any of the six faces is the same as the probability of getting every other face. b. A box has a two-headed coin and a fair coin. It is flipped n times, yielding heads each time. What is the probability that the two-headed coin is chosen	05 05	03	02
2	A normal random variable x has an unknown mean and standard deviation. The probability that x exceeds 4 is .9772, and the probability that x exceeds 5 is .9332. Find the mean μ and standard deviation σ.	10	03	03
3	You are given 100 measurements corresponding to a specific parameter. List at the maximum, 5 parameters that you would extract from the data, to describe the data. Justify with reasons (not more than 1 sentence) for each choice of parameter that you have made.	10	04	02
4	If the probability density of a random variable X is given by $f_X(x) = \begin{cases} k(1-x^2), & 0 \le x \le 1 \\ 0 & \text{otherwise.} \end{cases}$ 1. Find the value of k. 2. Find P(0.1 < x < 0.2). 3. Find P(x > 0.5) 4. Find mean and variance.	10	02	01
5	Assert or Reject the following statements with proper justification in each case. **Statement 1:** There exists a geometric random variable with probability of success P(Success) = ⅔. **Statement 2:** Conducting a survey among passengers going on a cruise ship in order to determine what the average person spends on a vacation.5 marks	05 05	04	0

Marks distribution	Particulars	CO1	CO2	CO3	CO4	CO5	L1	L2	L3	L4
	Max Marks	10	20	20	--	--	--	10	20	20

RV College of Engineering

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MAKEUP QUIZ

1. For any constant, a and a random variable X, Statement 1: Var(aX) = Var(- aX). - 2M
   a. Statement 1 is ALWAYS TRUE
   b. Statement 1 is ALWAYS FALSE
   c. Statement 1 is TRUE only for a = 0
   d. Statement 1 is TRUE only for a = ± 1

2. A recent study demonstrated that in Bangalore, only 40% of the population feel that its Metro rail system is adequate. If we choose 20 people from Bangalore at random, how many of these 20, can we expect to feel that the metro rail system is adequate? -2M
   a. Insufficient data to compute the expected value
   b. 8
   c. 16
   d. 4
   e. 10

3. The mode of a numerical data set measures the _____ of the data. -2M
   a) Variability b) Range c) Percentile d) Most frequent observation (e) Size

4. If A and B are independent events with P(A) = 0.2 and P(B) = 0.3, then $P(A \cap B|B) =$ -2M
   a) 0.3 b) 0.06 c) 0.2 d) 0.5

5. You toss a fair coin. Let the random variable X = 1 if you observe head and 0 if you observe a tail. Which of the following describes the probability distribution for X. -2M

a)

X	1/2	1/2
P(X=)	0	1

b)

X	0	1
P(X=)	1/2	1/3

c)

X =	1/2	1/2
P(X=)	1/3	2/3

d)

X	0	1
P(X=)	1/2	1/2