SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester: III
Class: SY	Program: MCA
Branch Code: M.C.A.	Pattern:2022
Name of Course: Data Science	Course Code:MCA223001
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains _____ page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Question No. 1 Attempt following Question

1a) Two coins are tossed 500 times, and we get: (6) CO2
Two heads: 105 times,
One head: 275 times,
No head: 120 times calculate the probability of each event to occur.

Question No. 2 Attempt following Question

2a) Examine the Mean, Variance and Standard Deviation of (6) CO5
the Following Numbers: 3, 5, 6, 10, 9, 10, 1, 3

Question No. 3 Attempt following Question

3a) a) Let X be a discrete random variable with the following PDF (8) CO1

X	0	1	2	3	4	5	6
P(x)	K	3k	5k	7k	9k	11k	13k

1. Find k.
2. Find P(X<4),Find P(X≥5)
3. Find probability distribution function
4. Find P(3<X≤6)

OR

3b) Given the p.d.f. (probability density function) of a continuous random variable x is (8) CO1

$f(x) = x^2/3$ $\quad$ $-1<x<2$

find 1. P(x<1),

2. P(x>0),

3. P(1<x<2).

Cumulative distribution function

3c) Describe in detail discrete random variable and continuous random variable. Write probability distribution function and cumulative distribution function for rolling an unbiased dice   (8)   CO1

OR

3d) c) Let X be a random variable, and P(X=x) is the PMF given by: (8)   CO1

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

(a) Find k

(b) Find P(0<X<4)

(c) P(X≤ 6)

P(3<x≤ 6)

Question No. 4 Attempt following Question

4a) a) calculate the mean, variance, Standard deviation and pdf of the random variable X having the following probability distribution.   (8)   CO3

X=x	1	2	3	4	5	6	7	8	9	10
P(x)	0.15	0.10	0.10	0.01	0.08	0.01	0.05	0.02	0.28	0.20

OR

4b) a) Let X be a random variable with PDF given by f(x)=kx^2 $-1 \le x \le 1$ (8)   CO3

0   otherwise   calculate

1. the constant k

2. E[X]

3. Var(X)

4. Standard Deviation of X

4c) Calculate the probability of getting at least 5 times head-on tossing an unbiased coin for 6 times by using the binomial distribution and also find mean, variance and standard deviation for the same.   (8)   CO3

4d) A light bulb manufacturing factory finds 3 in every 60 light bulbs defective. calculate the (8) CO3
probability that the first defective light bulb with be found when the 6th one is tested? And also
calculate mean, variance and standard deviation for the same.

Question No. 5 Attempt following Question

5a) a) solve the Karl Pearson's coefficient of correlation between x and y for the following data. (8) CO4

X	20	23	27	31	35	38	40	42
Y	18	20	24	30	32	34	36	38

OR

5b) a) Demonstrate spearman's rank coefficient of correlation in detail and Calculate the rank (8) CO4
correlation co-efficient between 'X' and 'Y' variables.

X	35	20	49	44	30
Y	24	35	39	48	45

5c) c) Differentiate between covariance and correlation and calculate the coefficient of covariance for (8) CO4
the following data:

X	3	5	2	7	4
Y	70	80	60	90	75

OR

5d) Calculate coefficient of correlation and obtain the lines of regression for the following data (8) CO4

X	1	2	3	4	5	6	7
Y	9	8	10	12	11	13	14

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