LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

U.G. DEGREE EXAMINATION – **ALLIED**

FIRST SEMESTER – **NOVEMBER 2024**

UCA1AR01 – MATHEMATICAL STATISTICS FOR COMPUTER SCIENCE

Date: 20-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

SECTION A - K1 & K2 (CO1)

Q.No	Levels	**Answer ALL the Questions** **(10 x 2 = 20)**
1	K1	Identify the types of statistics.
2		Define mean deviation.
3		Describe any two properties of correlation co-efficient.
4		Explain on mutually exclusive events.
5		Show an example of orthogonal matrix.
6	K2	State relative frequency.
7		Tell the range of given observations: 32, 41, 28, 54, 35, 26, 23, 33, 38, 40.
8		Express the formula of Karl Pearson's direct method of correlation co-efficient.
9		Give an example for independent event.
10		Discuss the uses of Cayley Hamilton theorem.

SECTION B – K3 & K4 (CO2)

		Answer ALL the Questions **(4 x 10 = 40)**
11	K3	Explain the data measurement techniques with example
		[OR]
12		Given the following frequency distribution, calculate the arithmetic mean.

Marks (x)	50	55	60	65	70	75
No. of students (f)	2	5	4	4	5	5

13	K3	Find the quartile deviation and the coefficient of quartile deviation for the following data. 23,8,5,16,33,7,24,5,30,33,37,30,9,11,26,32
		[OR]
14		The Science test scores of five students are: 92,88,80,68 and 52. Find variance and standard deviation.
15	K4	Calculate Karl Pearson's coefficient of correlation between the following series by using the actual mean method.

Husband's Age	21	22	23	24	25	26	27
Wife's Age	16	15	17	18	19	20	21

[OR]

16 A bag contains 3 red, 6 white and 7 blue balls. What is the probability that two balls drawn are white and blue?

17 Find the Eigen values and Eigen vectors of the matrix

$$A=\begin{bmatrix}3 & 1 & 4\\ 0 & 2 & 6\\ 0 & 0 & 5\end{bmatrix}$$

[OR]

18 Illustrate about symmetric, skew symmetric, Hermitian and skew Hermitian with suitable example

SECTION C – K5 & K6 (CO3)

Answer ALL the Questions **(2 x 20 = 40)**

19 K5 a. Find the median of the following data: (10 Marks)

Age	20–25	25–30	30–35	35–40	40–45	45–50	50–55	55–60
No. Persons	50	70	100	180	150	120	70	60

b. Calculate population skewness from the following data: 73,70,71,73,68,67,69,72,76,71 (10 Marks)

[OR]

20 K5 Calculate correlation coefficient for bivariate grouped data from the following data.

Class Y / Class X	10-20	20-30	30-40	40-50	50-60
15-25	6	3			
25-35	3	16	10		
35-45		10	15	7	
45-55			7	10	4
55-65				4	5

21 K6

a. Two cards are drawn at random from a well-shuffled pack of 52 cards. Show that the chance of drawing two aces is 1/221. (5 Marks)

b. From a pack of 52 cards, three are drawn at random. Find the chance that they are a king, a queen and a knave. (6 Marks)

c. Four cards are drawn from a pack of cards. Find the probability that i) all are diamond, ii) there is one card of each suit and iii) there are two spades and two hearts (9 Marks)

[OR]

22 K6 Test for Cayley- Hamilton theorem for the given matrix and hence find A^{-1}

$$\begin{bmatrix}1 & -1 & 4\\ 3 & 2 & -1\\ 2 & 1 & -1\end{bmatrix}$$
