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**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MAKE-UP EXAMINATION - SEP 2023**

Course Code : ECE3106

Course Name : ECE3106 - Introduction to Data Analytics

Program : B.Tech. Electronics and Communication Engineering

Date : 03.10.2023

Time : 9.30AM - 12.30PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
 - (ii) Question paper consists of 3 parts.
 - (iii) Scientific and non-programmable calculator are permitted.
 - (iv) Do not write any information on the question paper other than Roll Number.
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PART A

ANSWER ALL THE FIVE QUESTIONS

5 X 2 = 10M

1. There are different ways to sort the elements of a list. Identify the correct input command for sorting the list $b = ['saw', 'small', 'He', 'foxes', 'six']$ by their lengths
(CO2,CO1) [Knowledge]
2. The absolute deviation of a dataset is the distance between each data point and the mean. Find absolute Deviation of the values 15, 16 for the sequence 3, 6, 6, 7, 8, 11, 15, 16
(CO2,CO3) [Knowledge]
3. In probability theory and statistics, the continuous uniform distribution or rectangular distribution is a family of symmetric probability distributions.
A continuous Random Variable, X , follows a Uniform Distribution so that the probability of any value between 2 and 5 is p
What is the value of p ?
(CO4,CO3) [Knowledge]
4. In probability theory and statistics, the continuous *uniform distribution* or rectangular distribution is a family of symmetric probability distributions. An spring erupts every 91 minutes. You arrive there at random and wait for 20 minutes ... what is the probability you will see it erupt assuming it follows uniform distribution?
(CO2,CO3) [Knowledge]
5. Normal distribution is a continuous probability distribution wherein values lie in a symmetrical fashion mostly situated around the mean.
_ % of values less than the mean and _ % greater than the mean
(CO2,CO3) [Knowledge]

PART B

ANSWER ALL THE TWO QUESTIONS

2 X 15 = 30M

6. In probability theory and statistics, the Poisson distribution is a discrete probability distribution that expresses the probability of a given number of events occurring in a fixed interval of time or space. Assume that the number of emails per day follows a Poisson distribution. If you receive an average of two emails per week from your statistics professor, what is the probability that you will receive

- i) you will receive exactly one email from your statistics professor on Monday?
- ii) you will receive maximum 3 emails from your statistics professor on Monday?
- iii) you will receive minimum 1 emails from your statistics professor on Monday?

(CO3,CO2) [Comprehension]

7. Mean and Variance are the statistical parameters which define how a number of elements are spread with respect to each other

Ten friends scored the following marks in their end-of-year math exam:
23%, 37%, 45%, 49%, 56%, 63%, 63%, 70%, 72% and 82%

Find the

- a) mean, median, mode, variance (population), standard deviation,
- b) z-score, and z-score plot

(CO2,CO3) [Comprehension]

PART C

ANSWER ALL THE THREE QUESTIONS

3 X 20 = 60M

8. The line of best fit (or trendline) is an educated guess about where a linear equation might fall in a set of data plotted on a scatter plot.

Sam found how many hours of sunshine vs how many ice creams were sold at the shop from Monday to Friday:

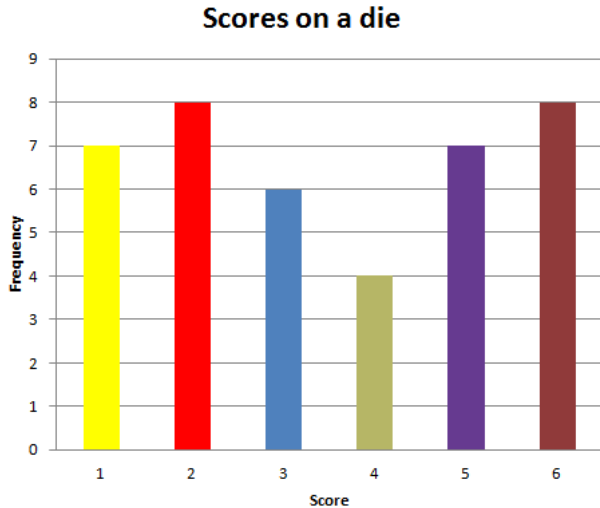
"x" Hours of Sunshine	"y" Ice Creams Sold
2	4
3	5
5	7
7	10
9	15

find the best m (slope) and b (y-intercept) that suits that data and the error. Write the equation for the line.

(CO1,CO2) [Application]

9. There are many cases where the data tends to be around a central value with no bias left or right, and it gets close to a "Normal Distribution".

Emma rolled a die a number of times and recorded her results in a bar graph, as follows:



The graph shows number 1 is appearing 7 times and so on

- a) What is mean and the variance?
- b) Find the standard deviation

(CO2,CO3) [Application]

10. Normally, an *array* is a collection of similar type of elements which has contiguous memory location. While defining an array, we can use `arrange` function followed by the starting number and the end number. `Reshape` function is used for converting the matrix into a particular size. Find the following for the array `a= np.arange(16). reshape ((4,4))`

- a) the matrix after reshape
- b) different types of splitting operations on the resultant matrix

(CO3,CO2,CO4) [Application]