Hall Ticket No | | | | | | | | | | | Course Code: AHSC08

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

B.Tech II SEMESTER CIE - I EXAMINATIONS JULY - 2022

Regulation: UG-20

PROBABILITY AND STATISTICS

Time: 2 Hours **(Common to CSE| CSE(AIML)| CSE(DS)| CSE(CS)| CSIT| IT)** **Max Marks: 20**

Answer any FOUR questions
All parts of the question must be answered in one place only

1. (a) What is the classical definition of probability? State the definitions of discrete and continuous random variables with suitable examples. [[BL: Understand| CO: 1| Marks: 2]

   (b) A fair coin is tossed until a head or five tails occurs. Find the expected number E of tosses of the coin. [BL: Apply| CO: 1| Marks: 3]

2. (a) Write the definition of mathematical expectation of a probability distribution function. List out the important properties of probability density function. [[BL: Understand| CO: 1| Marks: 2]

   (b) For the continuous random variable X whose probability density function is given by f(x)=$\begin{cases} cx(2-x), 0 \le x \le 2 \\ 0, otherwise \end{cases}$. Calculate c, mean and variance of X.

   [BL: Apply| CO: 1| Marks: 3]

3. (a) Explain the properties of Poisson distribution. Determine the recurrence relation for the Poisson distribution. [BL: Understand| CO: 2| Marks: 2]

   (b) The marks obtained in statistics in a certain examination found to be normally distributed. If 15% of the students greater than or equal to 60 marks, 40% less than 30 marks. Calculate the mean and standard deviation. [BL: Apply| CO: 2| Marks: 3]

4. (a) Write the properties of Binomial distribution. Determine the mean and variance of Binomial distribution. [BL: Understand| CO: 2| Marks: 2]

   (b) The variance and mean of a binomial variable X with parameters n and p are 3 and 4. Calculate i) P(X=1) ii) $P(X \ge 1)$ iii) P(0<X<3). [BL: Apply| CO: 2| Marks: 3]

5. (a) List out the types of correlation. Outline the properties of coefficient correlation and write the formula of rank correlation coefficient. [BL: Understand| CO: 3| Marks: 2]

   (b) Interpret the properties of rank correlation coefficient. The ranks of the 15 students in two subjects A and B are given below, the two numbers within the brackets denoting the ranks of the same student in A and B respectively. (1,10), (2,7), (3,2), (4,6), (5,4), (6,8), (7,3), (8,1), (9,11), (10,15), (11,9), (12,5), (13,14), (14,12), (15,13) Use Spearman's formula to calculate the rank correlation coefficient. [BL: Apply| CO: 3| Marks: 3]