BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI

WORK-INTEGRATED LEARNING PROGRAMMES DIVISION

M. Tech. Software Systems at Wipro Technologies (WASE)

Second Semester 2020 – 2021

Mid Semester Examination (MAKEUP)

Course Number	:	SSWT ZC111
Course Title	:	PROBABILITY & STATISTICS
Type of Exam	:	Online
Weightage	:	30 %
Duration	:	120 Minutes
Date of Exam	:	30/07/2021

No. of Pages : 2
No. of Questions : 10

Session: FN

Q1. For a variance of X , E(X) = 10 and var(X) = 25. Find the positive values of a and b such that Y = aX - b has expectation zero and variance 1. Also find the standard deviation of X.

Q2.A biased coin with probability of falling as heads 0.7 is tossed 20 times. Obtain the probability of getting 5 heads using Binomial, Poisson assumptions and compare.

Q3. The painted light bulbs produced by a company are 50% red, 30% green and 20% blue. In a sample of 5 bulbs, find the probability P that 2 are red, 1 is green and 2 are blue.

Q4. Let $f(x) = \begin{cases} kx, & 1 < x < 3 \\ 0, & \textit{elsewhere.} \end{cases}$

(a) Compute the value of the constant 'k' for which the function given above will be a valid probability density function.

(b) Calculate the cumulative distribution function of the above density function.

Q5. In a 5 match cricket series between Team A and B, The probability that the team A winning over team B is 0.6.

(a) Find the probability that Team A will win three matches.

(b) If any team that wins at least 3 matches will win the series, Find the probability that Team A will win the series.

Q6. Suppose X follows a continuous uniform distribution from 0 to 4. Find $P(X > 2 \mid X < 3)$.

Q7. An manufacturing company produces certain item whose life span is normally distributed with mean equal to 600 hours and a standard deviation of 20 hours. Find the probability that the life span of that item varies between 624 and 750 hours.

Q8. Three politicians P_1 ,P_2 ,P_3 of a state who have won the assembly elections try for the post of Chief Minister. Their chances of succeeding are 4:3:3. The Probability that a certain politician P_4 will be selected when P_1 ,P_2 ,P_3 is made Chief Minister are 0.3,0.2,0.1 respectively. What is the Probability that P_4 will not be selected for the post of Chief Minister?

Q9. The amount of time that an electrician requires to switch on the generator in a theater when the power goes off is a random variable having an exponential distribution with a mean of 4 minutes. What is the Probability that the electrician requires less than 2 minutes on at least 4 of the next 6 days to switch on the generator?

Q10.The daily number of parts filled by the parts department of a repair shop is a random variable with mean 120 and standard deviation 15. According to Chebyshev's theorem, with what probability can we assert that on any one day it will fill between 75 and 165 parts.

XXXXXXX

.