Reg.No: | | | | | | | |

SNS College of Technology, Coimbatore-35.
(An Autonomous Institution)
Internal Assessment -I
Academic Year 2022-2023(Even)
Third Semester
Department of Mathematics
19MAT204 - Probability and Statistics

A

Time: 1.30 Hours **Maximum Marks: 50**

				BLOOMS
		PART – A (5 x 2 = 10 MARKS) **ANSWER ALL QUESTIONS**		
1.		Define Random variable. Give examples.	CO1	(Rem)
2.		Events A and B are such that $P(A+B)=\frac{3}{4}, P(\bar{A})=\frac{1}{4}$, find $P(B)$.	CO1	(Rem)
3.		If f(x) = kx^2, 0 < x < 3 is to be density function, Find the value of k.	CO1	(Und)
4.		Check whether the following data following data follow a Binomial distribution or not.Mean =3,variance =4.	CO2	(Und)
5.		Write down the probability mass function of the Poisson distribution which is approximately equivalent to B(100,0.02) .	CO2	(Und)
		PART –B (2 × 13=26 MARKS) **ANSWER ALL QUESTIONS**		
6.	a) i) ii)	If A and B are independent events, prove that $\bar{A}$ and B are independent. (b) $\bar{A}$ and $\bar{B}$ are independent A random variable X has the following probability distribution X: 0, 1, 2, 3, 4, 5, 6, 7 P(X): 0, k, 2k, 2k, 3k, k2, 2k2, 7k2+k Compute : (a) The value of k (b) P(1.5 < X < 4.5 / X > 2) (c) The smallest value of c for which $P(X \le k) > \frac{1}{2}$.	CO1 CO1	(App) (6) (App) (7)
		(or)		
	b)	If a density function of a continuous R.V 'X' is given by	CO1	(Ana) (13)

		$f(x)=\begin{cases} ax\ ,0<x<1 \\ a\ ,1<x<2 \\ 3a-ax,\ 2<x<3 \\ 0\ \ ,oterwise \end{cases}$ Find (i) the value of 'a' (ii) P(X < 1.5) (ii) Cumulative Distribution		
7.	a)	Derive the MGF of Poisson distribution and hence find its mean and Variance.	CO2	(App) (13)
		(or)		
	b) i) ii)	If a Random variable X takes values X 1 2 3 4 such that2P(X=1) = 3P(X=2) = P(X=3) = 5P(X=4). Find probability mass function and mean, variance. Find the probability that atmost 2 defective fuses will be found in a box of 200 fuses if experiences shows that 2% of such fuses are defective.	CO2 CO2	(Ana) (6) (Ana) (7)
8.	a)	The contents of urns I, II, III are given by 1 white,2 black and 3 red balls; 2 white,1 black and 1 red balls;4 white,5 black and 3 red balls; One urn is chosen at random and two balls drawn. They happen to be white and red. What is the probability that they come from urns I, II and III?	CO1	(Ana) (7)
		(or)		
	b) i) ii)	Find the Moment Generating Function of the random variable with the Probability law P(X=x) = $q^{x-1}p, x=1,2...$ Find mean & variance. A car hire from two cars which it hires out day by day.The number of demands for a car on each day is distributed as poisson variate with mean 1.5.Calculate the proportion of day on which some demand is refused.	CO1 CO2	(App) (7) (App) (7)

Rem/Und: Remember/ Understand **App:** Apply **Ana:** Analyze **Eva:** Evaluate **Cre:** Create

Prepared by Verified by Dean(S&H)