ECHELON INSTITUTE OF TECHNOLOGY

Department of computer Applications

QUESTION BANK : UNIT 1(Probability & Statistics)

Course :BCA (DATA SCIENCE**)** **session** :July -Dec 2023

Q1. Define Distribution function and its three properties with prove .

Q2.A random variable X has the following probability function :

Values of X,x:	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	K^2	$2k^2$	$7k^2+k$

(i) find k.

(ii) Evaluate P(X<6), P(X≥6), and p(0<x<5) .

(iii) if P(X≤a)>$\frac{1}{2}$,find the minimum value of a .

(iv) Determine the distribution function of X.

Q3. The diameter of an electric cable, say X, is assumed to be a continuous random variable with p.d.f :

F(x) = 6x(1-x) , 0≤x≤1.

(i) check that f(x) is p.d.f

(ii) Determine a number b such that P(X<b)=P(X>b).

Q4. The probability distribution of a r.v .X is :

f(x)= ksin$\frac{1}{5}\pi x$, 0≤x≤5.

Determine the constant k and obtain the median and quartiles of the distribution.

Q5. In a binomial distribution consisting of 5 independents trials , probabilities of 1 and 2 successes are 0.4096 and 0.2048 respectively. Find the parameter 'p' of the distribution .

Q6. The probability of a man hitting a target is $\frac{1}{4}$:

(i) If he fires 7 times what is the probability of his hitting the target at least twice?

(ii) How many times must he fire so that the probability of his hitting the target at least once is greater than $\frac{2}{3}$?

Q7. Find moment generating function of Binomial and Poisson distribution.

Q8. Find moments of Poisson distribution .

Q9. A car hire firm has two cars, which it hires out day by day . The number of demands for a car on each day is distributed as a Poisson distribution with mean 1.5 . calculate the proportion of days on which

(i) neither car is used

(ii) the proportion of days on which some demands is refused .

Q10. Define Normal Distribution and chief characteristics of normal distribution.

Q11. Find median and moment generating function of Normal distribution.

Q12. Let X is normally distributed and the mean of X is 12 and S.D. is 4 .

(a) (i) $X \geq 20$,

(ii) $X \leq 20$

(iii) $0 \leq x \leq 12$

(b) find x' , when $P(X>x')=0.24$