SRM Institute of Science and Technology

College of Engineering and Technology Kattankulathur-603 203

Department of Mathematics

21MAB301T-Probability and Statistics

Sl.No.	Tutorial Sheet-1	Answers
	X 1 2 3 4 5 Find (i) the value of k_i (ii) $P(X < 4)$	k = 1/15, 6/15
1	$P[X=x] \mid k \mid 2k \mid 3k \mid 4k \mid 5k$	K = 1/13, 0/13
	X 0 1 2 3 4 5 6 7 8 Find (i) the	k = 1/80, CDF,
2	$P[X=x] \mid k \mid 3k \mid 5k \mid 7k \mid 9k \mid 11k \mid 13k \mid 15k \mid 16k$	$0, \alpha = 6$
	value of k ,(ii) the Distribution Function (CDF) (iii) $P(0 < X < 3/X >$	
	2) and (iv) the smallest value of α for which $P(X \le \alpha) > \frac{1}{2}$.	
3.	The probability density function (PDF) of a random variable X	k = 6,1/2
	is given by $f(x) = kx(1-x)$, $0 < x < 1$, Find k and a such that	
	P([X < a]) = P([X > a]).	1.7()
4.	The probability density function (PDF) of a random variable X is	k = 1, F(x) =
	given by $f(x) = kxe^{-x}$, $x > 0$, Find k and CDF of X	$1 - (x+1)e^{-x}, x > 0$
_	X $\begin{bmatrix} -2 & -1 & 0 & 1 & 2 & 3 \\ \hline P(k) & k & 2 & 2 & 2 & 2 \end{bmatrix}$ Find (i) the value of k_i (ii)	k = 1/15, CDF
5	$P[X=x] \mid 0.1 \mid k \mid 0.2 \mid 2k \mid 0.3 \mid 3k$	<i>N</i> = 1, 10, 321
	the Distribution Function (CDF)	1 1/00 CDP
6	$egin{array}{ c c c c c c c c c c c c c c c c c c c$	k = 1/80, CDF, $0, \alpha = 6$
	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	$0, \alpha = 0$
	`` ' 1	
	2) and (iv) the smallest value of α for which $P(X \le \alpha) > \frac{1}{2}$.	1 1/10
7	A random variable X has the following distribution	k = 1/10, 0.10,CDF,5/7, 4
	X 0 1 2 3 4 5 6 7 Find (i) the	0.10,CD1,3/7,4
	$P[X=x] \mid 0 \mid k \mid 2k \mid 2k \mid 3k \mid k^2 \mid 2k^2 \mid 7k^2 + k$	
	value of $k_i(ii)$ the Cumulative Distribution Function (CDF) (iii)	
	$P(1.5 < X < 4.5/X > 2)$ and (iv) the smallest value of α for which $P(X \le \alpha) > 1/2$	
	,	k = 1/2, CDF= $F(x) =$
	$\begin{cases} kx, & \text{when } 0 \le x \le 1 \end{cases}$	(0 x < 0)
8	Find the value of k for the pdf $f(x) = \begin{cases} k, & \text{when } 1 \le x \le 2 \\ 3k - kx, & \text{when } 2 \le x \le 3 \end{cases}$ otherwise	$\begin{cases} x^2/2, & 0 \le x \le 1 \\ (2x-1)/4, & 1 \le x \le 2, \end{cases}$
0	$3k - kx, \text{ when } 2 \le x \le 3$	$\begin{cases} (2x-1)/4, & 0 \le x \le 1 \\ (2x-1)/4, & 1 \le x \le 2, \\ (-x^2 + 6x - 5)/4, & 2 \le x \le 3 \\ 1, & x \ge 3 \end{cases}$
		$ \begin{array}{c c} (1, & x \ge 3 \\ 16/20 \end{array} $
	Also find (a) the CDF of X (b) $P(1.5 < X < 3.2/0.5 < X < 1.8)$	·
9	The cumulative distribution function (CDF) of a random variable X	k = 4, f(x) = 8/x, x > 2, 1
	is given by $F(x) = \int 1 - k/x^2$, when $x > 2$	$\int (\lambda) = 0/\lambda, \lambda \geq 2, 1$
	is given by $F(x) = \begin{cases} 1 - k/x^2, & \text{when } x > 2 \\ 0, & \text{otherwise.} \end{cases}$ Find k and the (i) pdf of	
	$X_{,}(ii) P(X > 1/X < 5).$	
10	The probability density function (PDF) of a random	k = 5,1/33 = 0.0303
	variable <i>X</i> is given by $f(x) = kx^4, -1 < x < 0$ Find <i>k</i> and $P([X > -1/2]/[X < -1/4])$.	
	$I([X \times -1/2]/[X \times -1/2]).$	