



SCHOOL OF COMPUTER SCIENCE AND APPLICATIONS

Odd Semester 2024-2025

Assignment III

Programme: PG – MCA

Course Code: M23DE0101

Semester: I

Course Title: Mathematics for Computer Applications

Section: A

Name of the Faculty: Dr. M Vinayaka Murthy

Date of Announcement: 03-03-25

Date of Submission: 12-03-25

Date of Submission: 12-09-20

Sl. No	Assignment Question	CO	PO	PSO																												
1.	<p>A random variable X has the following probability function:</p> <table> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>P(x)</td> <td>a</td> <td>3a</td> <td>5a</td> <td>7a</td> <td>9a</td> <td>11a</td> <td>13a</td> <td>15a</td> <td>17a</td> </tr> </table> <p>i) find the value of 'a', ii) $P(2 \leq X \leq 5)$, iii) Determine the distribution function of x</p>	x	0	1	2	3	4	5	6	7	8	P(x)	a	3a	5a	7a	9a	11a	13a	15a	17a	3	1,2	1,3								
x	0	1	2	3	4	5	6	7	8																							
P(x)	a	3a	5a	7a	9a	11a	13a	15a	17a																							
2	<p>Given the following bivariate probability distribution,</p> <table> <tr> <td>X \ Y</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>$\frac{1}{32}$</td> <td>$\frac{2}{32}$</td> <td>$\frac{2}{32}$</td> <td>$\frac{3}{32}$</td> </tr> <tr> <td>1</td> <td>$\frac{1}{16}$</td> <td>$\frac{1}{16}$</td> <td>$\frac{1}{8}$</td> <td>$\frac{1}{8}$</td> <td>$\frac{1}{8}$</td> <td>$\frac{1}{8}$</td> </tr> <tr> <td>2</td> <td>$\frac{1}{32}$</td> <td>$\frac{1}{32}$</td> <td>$\frac{1}{64}$</td> <td>$\frac{1}{64}$</td> <td>0</td> <td>$\frac{2}{64}$</td> </tr> </table> <p>Obtain i) $P(X \leq 1, Y = 2)$ ii) $P(Y = 3)$, iii) $P(X < 3, Y < 4)$, iv) marginal distribution of X and Y,</p>	X \ Y	1	2	3	4	5	6	0	0	0	$\frac{1}{32}$	$\frac{2}{32}$	$\frac{2}{32}$	$\frac{3}{32}$	1	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	2	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{64}$	0	$\frac{2}{64}$	3	1,3	1,2
X \ Y	1	2	3	4	5	6																										
0	0	0	$\frac{1}{32}$	$\frac{2}{32}$	$\frac{2}{32}$	$\frac{3}{32}$																										
1	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$																										
2	$\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{64}$	$\frac{1}{64}$	0	$\frac{2}{64}$																										
3.	<p>Verify the function $f(x) = \begin{cases} 6x(1-x), & \text{if } 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$ is PDF or not. Hence determine its mean.</p>	3	1,3	1,2																												
4	<p>Given the following Joint Probability distribution,</p> <table> <tr> <td>Y \ X</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>0</td> <td>0</td> <td>$\frac{1}{27}$</td> <td>$\frac{2}{27}$</td> </tr> <tr> <td>1</td> <td>$\frac{2}{27}$</td> <td>$\frac{3}{27}$</td> <td>$\frac{4}{27}$</td> </tr> <tr> <td>2</td> <td>$\frac{4}{27}$</td> <td>$\frac{5}{27}$</td> <td>$\frac{6}{27}$</td> </tr> </table> <p>Obtain i) Marginal distribution of X and Y, ii) the conditional distribution of X given Y = 1</p>	Y \ X	0	1	2	0	0	$\frac{1}{27}$	$\frac{2}{27}$	1	$\frac{2}{27}$	$\frac{3}{27}$	$\frac{4}{27}$	2	$\frac{4}{27}$	$\frac{5}{27}$	$\frac{6}{27}$	3	1,3	1,2												
Y \ X	0	1	2																													
0	0	$\frac{1}{27}$	$\frac{2}{27}$																													
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2	$\frac{4}{27}$	$\frac{5}{27}$	$\frac{6}{27}$																													

5	The number of accidents occurring in a city in a day is a Poisson variate with mean 0.8. Find the probability that on a randomly selected day i) there are no accidents, ii) there are accidents.	3	1,2	1,3																		
6	The length of a telephone conversation has been found to have an exponential distribution with mean 3 minutes. What is the probability that a call may last more than 1 minute?	3	1,2	1,2																		
7	<p>A random variable X has the following probability function:</p> <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>P(x)</td><td>0</td><td>k</td><td>2k</td><td>2k</td><td>3k</td><td>k²</td><td>2 k²</td><td>7 k² + k</td></tr></table> <p>i) find the value of k, ii) P(1 < X < 6), iii) Determine the distribution function of x</p>	x	0	1	2	3	4	5	6	7	P(x)	0	k	2k	2k	3k	k ²	2 k ²	7 k ² + k	3	1,2	1,2
x	0	1	2	3	4	5	6	7														
P(x)	0	k	2k	2k	3k	k ²	2 k ²	7 k ² + k														
8	The number of persons joining a cinema queue in a minute has Poisson distribution with parameter 5.8. Find the probability that i) no one joins the queue, ii) At least one person's join the queue.	3	1,2	1,3																		
9	Let X is normal variate with mean 42 and standard deviation 4. Find the probability that a value taken by X is i) less than 50, ii) between 43 and 46.	3	1,2	1,3																		
10	<p>Given the following bivariate probability distribution,</p> <table><tr><td>Y \ X</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>0</td><td>$\frac{3}{15}$</td><td>$\frac{1}{15}$</td><td>$\frac{1}{15}$</td></tr><tr><td>1</td><td>$\frac{1}{15}$</td><td>$\frac{3}{15}$</td><td>$\frac{1}{15}$</td></tr><tr><td>2</td><td>$\frac{1}{15}$</td><td>$\frac{1}{15}$</td><td>$\frac{3}{15}$</td></tr></table> <p>Obtain i) verify PDF or not and find marginal distribution of X and Y, ii) the conditional distribution of X given Y = 2</p>	Y \ X	-1	0	1	0	$\frac{3}{15}$	$\frac{1}{15}$	$\frac{1}{15}$	1	$\frac{1}{15}$	$\frac{3}{15}$	$\frac{1}{15}$	2	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{3}{15}$	3	1,2	1,3		
Y \ X	-1	0	1																			
0	$\frac{3}{15}$	$\frac{1}{15}$	$\frac{1}{15}$																			
1	$\frac{1}{15}$	$\frac{3}{15}$	$\frac{1}{15}$																			
2	$\frac{1}{15}$	$\frac{1}{15}$	$\frac{3}{15}$																			
11	Let X is normal variate with mean 45 and standard deviation 4. Find the probability that a value taken by X is between 42 and 48.	3	1,2	1,2																		
12	The life time of a certain kind of battery is a random variable which has exponential distribution with mean of 250 hours, find the probability that such a battery will last anywhere between 300 and 500 hours	3	1,2	1,3																		


Subject Teacher
H O D**Director**