

Name. _____						Printed Pages:01							
Student Admn. No.: _____													
School of Basic Sciences Back Paper Examination Even Semester (Non - Graduating Batches) – June 2024 [Programme: B.Tech] [Semester:] [Batch:]													
Course Title: PROBABILITY AND STATISTICS						Max Marks: 100							
Course Code: MATH2003						Time: 3 Hrs.							
Instructions:		1. All questions are compulsory. 2. Assume missing data suitably, if any.											
SECTION-A (15 Marks) 5 Marks each													
1.	From the following data compute standard deviation										K3	CO3	5
	Class interval	0-4	4-8	8-12	12-16								
	Frequency	4	8	2	1								
2.	The probability that a patient recover from a rare blood disease is 0.4. If 15 people are known to have contacted this disease, what is the probability that (a) From 3 to 8 survive? (b) Exactly 5 survive?										K2	CO3	5
3.	Calculate mean of the of the following										K3	CO3	5
	Hight	65	66	67	68	69	70	71	72	73			
	No of plants	1	4	5	7	11	10	6	4	2			
SECTION-B(40 Marks) 10 Marks each													
4.	Fit a straight line to the following data										K3	CO4	10
	x	1	2	3	4	5							
	y	14	27	40	55	68							
5.	The joint probability function of two discrete random variables X and Y is given by $f(x,y) = c(2x+y)$, where x and y can assume all integers such that $0 \leq x \leq 2$, $0 \leq y \leq 3$ and $f(x,y)=0$ otherwise, Find the marginal probability function (a) of X (b) of Y										K3	CO4	10
6.	From a lot of 12 items containing three defective items, a sample of 4 items are drawn at random without replacement. Let a random variable X denotes the number of defective items in the sample. Find the probability distribution of X.										K3	CO4	10
7.	The distribution function for a random variable X is										K3	CO4	10
	$F(x) = \begin{cases} 1 - e^{-2x}, & x \geq 0, \\ 0, & x < 0 \end{cases}$												
	(a) Find density function. (b) Probability that $X > 2$ (c) The probability that $-3 < X \leq 4$												

SECTION-C (45 Marks)

15 Marks each

8.	<p>Find regression lines for the following data.</p> <table border="1" data-bbox="180 315 810 456"> <tbody> <tr> <td>x</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>y</td> <td>2</td> <td>5</td> <td>3</td> <td>8</td> <td>7</td> </tr> </tbody> </table>	x	1	2	3	4	5	y	2	5	3	8	7	K3	CO4	15
x	1	2	3	4	5											
y	2	5	3	8	7											
9.	<p>Find the linear least square polynomial based on the data</p> <table border="1" data-bbox="159 566 1070 698"> <tbody> <tr> <td>x</td> <td>-2</td> <td>-1</td> <td>0</td> <td>1</td> </tr> <tr> <td>y</td> <td>6</td> <td>3</td> <td>2</td> <td>2</td> </tr> </tbody> </table>	x	-2	-1	0	1	y	6	3	2	2	K3	CO4	15		
x	-2	-1	0	1												
y	6	3	2	2												
10	<p>If the density function of a continuous random variable X is given by</p> $f(x) = \begin{cases} 0, & x < 0 \\ ax, & 0 \leq x \leq 2 \\ (4-x)a, & 2 \leq x \leq 4 \\ 0, & x > 4 \end{cases}$ <p>(i) Find the value of a. (ii) Find cdf of X.</p>	K4	CO4	15												