

HALL TICKET NUMBER

--	--	--	--	--	--	--	--	--	--

PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE  
(AUTONOMOUS)

II B.TECH I SEMESTER END SUPPLEMENTARY EXAMINATIONS, MARCH/APRIL- 2023  
STATISTICS FOR DATA SCIENCE  
(AIDS Branch)

Time: 3 hours

Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

PART-A

Answer all the questions in Part-A (5X2=10M)

Q.No.	Questions	Marks	CO	KL
1	a) What do you mean by measure of Dispersion? List various measures of Dispersion.	[2M]	1	
	b) State some properties of Normal distribution.	[2M]	2	
	c) Find the value of the finite population correction factor for n= 10 and N= 1000.	[2M]	3	
	d) Define Null Hypothesis and Alternative Hypothesis.	[2M]	4	
	e) Write Normal equations to fit a line.	[2M]	5	

PART-B

Answer One Question from each UNIT (5X10=50M)

Q.No.	Questions	Marks	C	KL																				
<u>UNIT-I</u>																								
2.	a) Calculate the Arithmetic Mean for the following paired data. <table border="1" style="margin-left: 20px;"> <tr> <td>ROLL No'S</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><td>9</td> </tr> <tr> <td>MARKS</td> <td>4</td><td>5</td><td>5</td><td>7</td><td>5</td><td>6</td><td>7</td><td>3</td><td>4</td> </tr> </table>	ROLL No'S	1	2	3	4	5	6	7	8	9	MARKS	4	5	5	7	5	6	7	3	4	[5M]	1	
ROLL No'S	1	2	3	4	5	6	7	8	9															
MARKS	4	5	5	7	5	6	7	3	4															
	b) Obtain the binomial distribution with mean 3 and variance 4.	[5M]	1																					
<u>OR</u>																								
3.	a) Calculate the Median for the following paired data. <table border="1" style="margin-left: 20px;"> <tr> <td>Marks</td> <td>10-</td><td>25-</td><td>40-</td><td>55-</td><td>70-</td><td>85-</td> </tr> <tr> <td>Frequenc</td> <td>6</td><td>20</td><td>44</td><td>26</td><td>3</td><td>1</td> </tr> </table>	Marks	10-	25-	40-	55-	70-	85-	Frequenc	6	20	44	26	3	1	[5M]	1							
Marks	10-	25-	40-	55-	70-	85-																		
Frequenc	6	20	44	26	3	1																		
	b) A random variable x has the following probability function: <table border="1" style="margin-left: 20px;"> <tr> <td>X</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 = K)</td> <td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td> </tr> </table> i) Find value of K (ii) mean (iii) variance	X	1	2	3	4	5	6	7	8	P(X = K)	2	3	4	5	6	7	8	[5M]	1				
X	1	2	3	4	5	6	7	8																
P(X = K)	2	3	4	5	6	7	8																	
<u>UNIT-II</u>																								
4.	A continuous random variable X has the distribution function $F(x) = \begin{cases} 0 & , \text{if } x \leq 1 \\ k(x-1)^4 & , \text{if } 1 < x \leq 3 \\ 1 & , \text{othr wise} \end{cases}$ Determine (i) f(x) (ii) k (iii) mean.	[10M]	2																					
<u>OR</u>																								
5.	The marks obtained in mathematics by 1000 students are normally distributed with mean 78% and standard deviation 11%. Determine i) How many students got marks above 90%? ii) What was the highest mark obtained by lowest 10% of students? ii) Within limits did the middle of 90% of students lie?	[10M]	2																					
<u>UNIT-III</u>																								

6.		Samples of size 2 are taken from the population 4,8,12,16,20,24 with replacement. Find: (a) The mean of the population. (b) The standard deviation of the population. (c) Mean of the sampling distribution of means. (d) The standard deviation of the sampling distribution of means.	[10M]	3																																													
OR																																																	
7.	a)	A random sample of size 100 is taken from an infinite population having the mean $\mu = 76$ and variance $\sigma^2 = 256$ . What is probability that $\bar{x}$ will be between 75 and 78?	[5M]	3																																													
	b)	A random sample of 400 items is found to have mean 82 and S.D of 18. Find the maximum error of estimation at 95% confidence interval?	[5M]	3																																													
UNIT-IV																																																	
8.	a)	Among the items produced by a factor out of 800, 65 were defective in another sample out of 300, 40 were defective. Test the significance between the differences of two proportions at 1% level.	[5M]	4																																													
	b)	A sample analysis of examination results of 500 students was made. It was found that 220 students had failed, 170 had secured a third class, 90 were placed in second class and 20 got a first class. Do these figures commensurate with the general examination result which is in the ratio of 4 : 3 : 2 : 1 for the various categories respectively.	[5M]	4																																													
OR																																																	
9.	a)	A random sample of 10 boys had the following I.Q's: 70, 120, 110, 101, 88,83,95,98,107 and 100. i) Do these data support the assumption of population mean I.Q;s of 100? ii) Find the reasonable range in which most of the mean I.Q. values of sample of 10 boys lie	[5M]	4																																													
	b)	Four coins were tossed 160 times and the 0, 1, 2, 3 and 4 results were obtained 17, 52, 54, 31 and 6 times. Under the assumption that coins are balanced, find the expected frequencies of 0, 1, 2, 3 or 4 heads, and test the goodness of fit at level of significance 0.05.	[5M]	4																																													
UNIT-V																																																	
10.		Calculate the Two Regression lines for the following data. <table border="1" style="margin-left: 20px;"> <tbody> <tr> <td>x</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>9</td> </tr> <tr> <td>y</td> <td>1</td> <td>1</td> <td>2</td> <td>1</td> <td>2</td> <td>1</td> </tr> </tbody> </table>	x	1	1	1	1	1	9	y	1	1	2	1	2	1	[10M]	5																															
x	1	1	1	1	1	9																																											
y	1	1	2	1	2	1																																											
OR																																																	
11.	a)	Find a curve $y = ab^x$ for the following data. <table border="1" style="margin-left: 20px;"> <tbody> <tr> <td>x</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>y</td> <td>15</td> <td>10</td> <td>6</td> <td>5</td> <td>2</td> <td>8</td> </tr> </tbody> </table>	x	1	2	3	4	5	6	y	15	10	6	5	2	8	[5M]	5																															
x	1	2	3	4	5	6																																											
y	15	10	6	5	2	8																																											
	b)	Calculate rank correlation to the following data: <table border="1" style="margin-left: 20px;"> <tbody> <tr> <td>X</td> <td>6</td> <td>6</td> <td>7</td> <td>5</td> <td>6</td> <td>8</td> <td>7</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td></td> <td>8</td> <td>4</td> <td>5</td> <td>0</td> <td>4</td> <td>0</td> <td>5</td> <td>0</td> <td>5</td> <td>4</td> </tr> <tr> <td>y</td> <td>6</td> <td>5</td> <td>6</td> <td>4</td> <td>8</td> <td>6</td> <td>6</td> <td>4</td> <td>5</td> <td>7</td> </tr> <tr> <td></td> <td>2</td> <td>8</td> <td>8</td> <td>5</td> <td>1</td> <td>0</td> <td>8</td> <td>8</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	X	6	6	7	5	6	8	7	4	5	6		8	4	5	0	4	0	5	0	5	4	y	6	5	6	4	8	6	6	4	5	7		2	8	8	5	1	0	8	8	0	0	[5M]	5	
X	6	6	7	5	6	8	7	4	5	6																																							
	8	4	5	0	4	0	5	0	5	4																																							
y	6	5	6	4	8	6	6	4	5	7																																							
	2	8	8	5	1	0	8	8	0	0																																							

\*\*\*\*\*