

Code No: P21BST07

HALL TICKET NUMBER

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

II B.TECH I SEMESTER END SUPPLEMENTARY EXAMINATIONS, MARCH/APRIL - 2023

PROBABILITY & STATISTICS
(Common to CE,CSE,CSIT Branches)

Time: 3 hours

Max. Marks: 70

Answer all the questions from each UNIT (5X14=70M)

Q.No.	Questions	Marks	CO	KL																						
UNIT-I																										
1.	a) Find the Mean and Median from the following data <table border="1" style="margin-left: 20px;"> <tr> <td>x</td><td>24.5</td><td>34.5</td><td>44.5</td><td>54.5</td><td>64.5</td><td>74.5</td><td>84.5</td><td>94.5</td> </tr> <tr> <td>f</td><td>5</td><td>12</td><td>15</td><td>20</td><td>18</td><td>10</td><td>6</td><td>4</td> </tr> </table>	x	24.5	34.5	44.5	54.5	64.5	74.5	84.5	94.5	f	5	12	15	20	18	10	6	4	[7M]	1					
x	24.5	34.5	44.5	54.5	64.5	74.5	84.5	94.5																		
f	5	12	15	20	18	10	6	4																		
	b) Lives of two models of refrigerators A and B are given below. Which model would you suggest to purchase? <table border="1" style="margin-left: 20px;"> <tr> <td>Life in years</td><td>Model A</td><td>Model B</td> </tr> <tr> <td>0-2</td><td>5</td><td>2</td> </tr> <tr> <td>2-4</td><td>16</td><td>7</td> </tr> <tr> <td>4-6</td><td>13</td><td>12</td> </tr> <tr> <td>6-8</td><td>7</td><td>19</td> </tr> <tr> <td>8-10</td><td>5</td><td>9</td> </tr> <tr> <td>10-12</td><td>4</td><td>1</td> </tr> </table>	Life in years	Model A	Model B	0-2	5	2	2-4	16	7	4-6	13	12	6-8	7	19	8-10	5	9	10-12	4	1	[7M]	1		
Life in years	Model A	Model B																								
0-2	5	2																								
2-4	16	7																								
4-6	13	12																								
6-8	7	19																								
8-10	5	9																								
10-12	4	1																								
OR																										
2.	a) Calculate Karl Pearson coefficient of Skewness from the following data <table border="1" style="margin-left: 20px;"> <tr> <td>CI</td><td>0-10</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td><td>50-60</td><td>60-70</td><td>70-80</td> </tr> <tr> <td>f</td><td>6</td><td>12</td><td>22</td><td>48</td><td>56</td><td>32</td><td>18</td><td>6</td> </tr> </table>	CI	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	f	6	12	22	48	56	32	18	6	[7M]	1					
CI	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80																		
f	6	12	22	48	56	32	18	6																		
	b) Define Pearson's measure of Skewness. What is the difference between a relative measure and the absolute measure of skewness	[7M]	1																							
UNIT-II																										
3.	a) By the method of least squares, to fit a straight line the following data <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> </tr> <tr> <td>y</td><td>14</td><td>27</td><td>40</td><td>55</td><td>68</td> </tr> </table>	x	1	2	3	4	5	y	14	27	40	55	68	[7M]	2											
x	1	2	3	4	5																					
y	14	27	40	55	68																					
	b) Fit a parabola to the following data f(-1)=2, f(0)=1, f(1)=2, f(2)=4	[7M]	2																							
OR																										
4.	a) Explain Regression.	[7M]	2																							
	b) Calculate coefficient of correlation from the following data <table border="1" style="margin-left: 20px;"> <tr> <td>x</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td> </tr> <tr> <td>y</td><td>18</td><td>19</td><td>19</td><td>16</td><td>17</td><td>16</td><td>16</td><td>15</td><td>13</td><td>11</td> </tr> </table>	x	21	22	23	24	25	26	27	28	29	30	y	18	19	19	16	17	16	16	15	13	11	[7M]	2	
x	21	22	23	24	25	26	27	28	29	30																
y	18	19	19	16	17	16	16	15	13	11																
UNIT-III																										
5.	a) In a bolt factory machines A,B,C manufacture 20%, 30% and 50% of the total of their output and 6%,3% and 2% are defective. A bolt is drawn at random and found to be defective. Find the probabilities that is manufactured from (i) Machine A, (ii) Machine B (iii) Machine C.	[7M]	3																							



	b)	A random variable X has the following probability function Find (i) K (ii) Expectation (iii) Variance	[7M]	3															
		<table border="1"> <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>P(x)</td> <td>K</td> <td>3K</td> <td>5K</td> <td>7K</td> <td>9K</td> <td>11K</td> </tr> </table>	x	1	2	3	4	5	6	P(x)	K	3K	5K	7K	9K	11K			
x	1	2	3	4	5	6													
P(x)	K	3K	5K	7K	9K	11K													
OR																			
6.	a)	If a random variable has a Poisson distribution such that $P(1)=P(2)$, Find (i) Mean of the distribution (ii) $P(4)$ (iii) $P(X > 1)$ (iv) $P(1 < X < 4)$	[7M]	3															
	b)	In a binomial distribution consisting of 5 independent trials, Probabilities of 1 and 2 success are 0.4096 and 0.2048 respectively. Find the parameter p of the distribution.	[7M]	3															
UNIT-IV																			
7.	a)	If the population is 3,6,9,15,27 i. List all possible samples of size 3 that can be taken without replacement from the finite population. ii. Calculate the mean of each of the sampling distribution of means. iii. Find the standard deviation of sampling distribution of means.	[7M]	4															
	b)	Explain types of sampling.	[7M]	4															
OR																			
8.	a)	Explain methods of point estimation.	[7M]	4															
	b)	A random sample of size 64 is taken from a normal population with mean 51.4 and S.D 6.8. What is the probability that the mean of the sample will i. Exceed 52.9 ii. Fall between 50.5 and 52.3 iii. Be less than 50.6	[7M]	4															
UNIT-V																			
9.	a)	Explain one tailed and two tailed tests.	[7M]	5															
	b)	A manufacturer claimed that at least 95% of the equipment which he supplied to a factory conformed to specifications. An examination of ample of 200 pieces of equipment revealed that 18 were faulty. Test his claim at 5% level of significance. A manufacturer claimed that at least 95% of the equipment which he supplied to a factory conformed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty. Test his claim at 5% level of significance.	[7M]	5															
OR																			
10.	a)	Explain test of significance for difference of proportions.	[7M]	5															
	b)	A random sample of size 100 from a large population gave the following distribution <table border="1"> <tr> <td>Value</td> <td>10-20</td> <td>20-30</td> <td>30-40</td> <td>40-50</td> <td>50-60</td> </tr> <tr> <td>Frequency</td> <td>13</td> <td>20</td> <td>45</td> <td>13</td> <td>9</td> </tr> </table> Test the hypothesis that this sample comes from a population with mean 40. You are given that the population standard deviation is 10	Value	10-20	20-30	30-40	40-50	50-60	Frequency	13	20	45	13	9	[7M]	5			
Value	10-20	20-30	30-40	40-50	50-60														
Frequency	13	20	45	13	9														
