



R20 Regulation

Subject code: 3B4AA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

TKRCET
Approved by AICTE, Government of Andhra Pradesh

B.Tech IV Semester Supplementary Examinations, December 2024

PROBABILITY & STATISTICS

(Common to CE, CSE & IT)

Maximum Marks: 70

Date: 03.12.2024

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Allow the statistical table

Part-A

All the following questions carry equal marks (10X2M=20) Marks)		CO	Bloom Tx
1	List the properties of probability distribution function	1	L1
2	Define Poisson distribution	1	L1
3	Define standard error of a Statistic	2	L1
4	How many different samples of size $n=2$ can be chosen from a finite population of size $N=25$.	2	L1
5	Write short notes on type I and type II errors.	3	L1
6	Write the test statistic for difference of two proportions in large samples.	3	L1
7	If $\bar{x} = 47.5, \mu = 42.1, S = 8.4$ and $n=25$ then find the value of test statistic t .	4	L1
8	Explain about goodness of fit.	4	L1
9	If θ is the angle between two regression lines and standard deviation of y is twice the standard deviation of x and $r = 0.25$ then find $\tan \theta$	5	L1
10	Write the normal equations for parabola.	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	A continuous random variable has the probability function $f(x) = \begin{cases} K x e^{-\lambda x} & \text{for } x \geq 0, \lambda > 0 \\ 0 & \text{otherwise} \end{cases}$ Determine (i) k (ii) Mean (iii) Variance [10M]	1	L2

OR

12	1000 students has written an examination the mean of marks is 35 and standard deviation is 5. [10M] Assuming the distribution to be normal find (i) How many students to marks lie between 25 and 40. (ii) How many get more than 40 (iii) How many students get below 20 (iv) How many get more than 50	1	L2
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13	A population consists of five numbers 5,2,6,12 and 11. Consider all possible samples of size two Which can be drawn without replacement from this population. Find i) The population mean. ii) The standard deviation of the population. iii) The mean of the sampling distribution of means. iv) standard deviation of the sampling distribution of means. [10M]	2	L2																				
OR																							
14	A sample of size 300 was taken whose variance is 225 and mean 54. Construct 95% confidence interval for the mean. And also find maximum error of mean at 95% confidence? [10M]	2	L2																				
15	A researcher wants to know the intelligence of students in a school. He selected two groups of students. In the first group there 150 students having mean IQ of 75 with a S.D of 15 in the second group there are 250 students having mean IQ of 70 with S.D of 20. Test the hypothesis at 5% l.o.s. [10M]	3	L2																				
OR																							
16	In a city A 20% of a random sample of 900 school boys has certain slight physical defect. In another city B 18.5% of a random sample of 1600 schoolboys has the same defect. Is the difference between the proportion significance at 5% l.o.s. [10M]	3	L2																				
17	Use F- test to the following data to test the significance of variances [10M]	4	L2																				
	<table border="1"> <tbody> <tr> <td>X</td> <td>67</td> <td>24</td> <td>57</td> <td>55</td> <td>63</td> <td>54</td> <td>56</td> <td>68</td> <td>33</td> <td>43</td> </tr> <tr> <td>Y</td> <td>70</td> <td>38</td> <td>58</td> <td>58</td> <td>56</td> <td>67</td> <td>68</td> <td>75</td> <td>42</td> <td>38</td> </tr> </tbody> </table>			X	67	24	57	55	63	54	56	68	33	43	Y	70	38	58	58	56	67	68	75
X	67	24	57	55	63	54	56	68	33	43													
Y	70	38	58	58	56	67	68	75	42	38													
OR																							
18	A random sample of 10 boys had the following I.Q's : 70,120,110,101,88,83,95,98,107,100 (a)Do these data support the assumption of a population mean I.Q of 100 (b) Find a reasonable range in which most of the mean I.Q values of samples of 10 boys lie. [10M]	4	L2																				
19	Calculate the Regression equation of X on Y from the data given below and also find the value of X when Y = 15. [10M]	5	L2																				
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OR																							
20	Fit a straight line to the following data. [10M]	5	L2																				
	<table border="1"> <tbody> <tr> <td>X_i</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>y_i</td> <td>2.5</td> <td>5.2</td> <td>9.7</td> <td>16.5</td> <td>29.4</td> <td>35.5</td> <td>54.4</td> </tr> </tbody> </table>			X_i	1	2	3	4	5	6	7	y_i	2.5	5.2	9.7	16.5	29.4	35.5	54.4				
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