R18 Regulation *Subject code: 2H3AE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, July 2024

Probability & Statistics

(Common to CE,ME,CSE & IT)

Maximum Marks: 70 Date:18.07.2024 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 STASTICAL TABLE

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		CO	Bloom Tx
1	Define a Random Variable.	1	L1
2	List the properties of probability distribution function	1	L1
3	Define binomial distribution	2	L1
4	Define Poisson distribution	2	L1
5	Define correlation and write the types of correlation	3	L1
6	Test whether the equations $2x + 3y = 4$, and $x-y=5$ represent valued regression lines	3	L1
7	Write short notes on type I and type II error	4	L1
8	Write the formulae for test of significance of single mean & two proportions for large samples.	4	L1
9	Write the uses of chi – square test	5	L1
10	Write the applications of t-test.	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)										
11	The probability density function of a variable 'x' is [10M]								1	L2
		x	0	1	2	3	4	5	6	
		P(x)	k	3k	5k	7k	9k	11k	13k	
	i) Find 'k' ii)Find $p(x < 4)$, $p(3 < x \leq 6)$ iii)What will be the minimum value of 'M' so that $p(x \leq M) > 0.3$?									
	OR									
12	A continuous random variable has the probability function [10M] $f(x) = \begin{cases} K\, x\, e^{-\lambda x} & \text{for } x \geq 0,\ \lambda > 0 \\ 0 & \text{otherwise} \end{cases}$ Determine (i) k (ii) Mean (iii) Variance								1	L2

<table>
<tr><td>13</td><td>If 10% of the rivets produced by a machine are defective, find the probability that out of 5 rivets chosen of random (i)Non will be defective (ii) one will be defective (iii) at most two rivets will be defective [10M]</td><td>2</td><td>L2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td></tr>
<tr><td>14</td><td>Find the mean and S.D of the normal distribution in which 7% of the items are under 35 and 89% are under 63 [10M]</td><td>2</td><td>L2</td></tr>
<tr><td>15</td><td>Find if there is any significant correlation between the heights and weights given below [10M]
<table>
<tr><td>Height in inches</td><td>57</td><td>59</td><td>62</td><td>63</td><td>64</td><td>65</td><td>55</td><td>58</td><td>57</td></tr>
<tr><td>Weight in lbs</td><td>113</td><td>117</td><td>126</td><td>126</td><td>130</td><td>129</td><td>111</td><td>116</td><td>112</td></tr>
</table></td><td>3</td><td>L2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td></tr>
<tr><td>16</td><td>Fit a straight line to the following data. [10M]
<table>
<tr><td>Xi</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>yi</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>
</table></td><td>3</td><td>L2</td></tr>
<tr><td>17</td><td>The mean life time of a sample of 100 light tubes produced by a company is found to be 1560 hrs with a population S.D of 90 hrs. Test the hypothesis that the mean life time of the tubes produced by the company is 1580 hrs. [10M]</td><td>4</td><td>L2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td></tr>
<tr><td>18</td><td>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. [10M]</td><td>4</td><td>L2</td></tr>
<tr><td>19</td><td>The number of automobile accidents per week in a certain community are as follows : 12,8,20,2,14,10,15,6,9,4. Are these frequencies in agreement with the3 belief that accident conditions were the same during this 10 week period. [10M]</td><td>5</td><td>L2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td></tr>
<tr><td>20</td><td>To compare two kinds of bumper guards 6 of each kind were mounted on a car and then the car was run in to a concrete wall the following are the costs of repairs. Use the 0.01 level of significance to test whether the difference between two sample means is significant. [10M]
<table>
<tr><td>Guard1</td><td>107</td><td>148</td><td>123</td><td>165</td><td>102</td><td>119</td></tr>
<tr><td>Gaurd2</td><td>134</td><td>115</td><td>112</td><td>151</td><td>133</td><td>129</td></tr>
</table></td><td>5</td><td>L2</td></tr>
</table>