R20 Regulation *Subject code: 3B4AA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, June 2026

PROBABILITY & STATISTICS

(Common to CE, CSE & IT)

Maximum Marks: 70 Date: 08.06.2026 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.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	List the properties of probability distribution function.	2M	1	L1
2	Define Poisson distribution.	2M	1	L1
3	Define standard error of a Statistic.	2M	2	L1
4	Write the 95% confidence limits for population mean in case of large samples.	2M	2	L1
5	Write about (i) Null Hypothesis (ii) Alternative Hypothesis	2M	3	L1
6	What is meant by level of significance.	2M	3	L1
7	Write the assumptions of student's t- test.	2M	4	L1
8	Write the uses of Chi – square test.	2M	4	L1
9	Define correlation and write the types of correlation.	2M	5	L1
10	Write the uses of regressions.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
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. 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	10M	1	L2

<table>
<tr><td>13</td><td>A population consists of five numbers 2,3,6,8, and 11. Consider all possible samples of size two Which can be drawn with 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.</td><td>10M</td><td>2</td><td>L2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td>14</td><td>Show that $s^2 = \frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x})^2$ is not unbiased estimator of the parameter σ^2, but $S^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2$ is unbiased estimator of the parameter σ^2.</td><td>10M</td><td>2</td><td>L2</td></tr>
<tr><td>15</td><td>The means of two large sample of sizes 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of S.D 2.5 inches.</td><td>10M</td><td>3</td><td>L2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td>16</td><td>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 school boys has the same defect. Is the difference between the proportion significance at 5% l.o.s.</td><td>10M</td><td>3</td><td>L2</td></tr>
<tr><td>17</td><td>A sample of 29 students have a mean weight of 70 kgs. Can this be regarded as a sample from a population with mean weight 56 kgs and standard deviation 25 kgs.</td><td>10M</td><td>4</td><td>L2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td>18</td><td>Given the following contingence table for hair colour and eye colour .find the value of Chi- square Is there good association between the two.
<table>
<tr><td colspan="6">Hair colour</td></tr>
<tr><td rowspan="5">Eye colour</td><td></td><td>Fair</td><td>Brown</td><td>Black</td><td>Total</td></tr>
<tr><td>Blue</td><td>15</td><td>5</td><td>20</td><td>40</td></tr>
<tr><td>Grey</td><td>20</td><td>10</td><td>20</td><td>50</td></tr>
<tr><td>Brown</td><td>25</td><td>15</td><td>20</td><td>60</td></tr>
<tr><td>total</td><td>60</td><td>30</td><td>60</td><td>150</td></tr>
</table></td><td>10M</td><td>4</td><td>L2</td></tr>
<tr><td>19</td><td>From the following data calculate the rank correlation coefficient after making adjustment for tied ranks.
<table>
<tr><td>X</td><td>48</td><td>33</td><td>40</td><td>9</td><td>16</td><td>16</td><td>65</td><td>24</td><td>16</td><td>57</td></tr>
<tr><td>y</td><td>13</td><td>13</td><td>24</td><td>6</td><td>15</td><td>64</td><td>20</td><td>9</td><td>16</td><td>19</td></tr>
</table></td><td>10M</td><td>5</td><td>L2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td>20</td><td>Fit a following of the curve $y = ae^{bx}$
<table>
<tr><td>X</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>Y</td><td>144</td><td>172.8</td><td>207.4</td><td>248.8</td><td>298.5</td></tr>
</table></td><td>10M</td><td>5</td><td>L2</td></tr>
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