R20 Regulation *Subject code: 3B3CA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, JUNE 2026

PROBABILITY & STATISTICS AND COMPLEX VARIBLE

(ME)

Maximum Marks: 70 Date: 09.06.2026 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	Define a Random Variable.	2M	1	L1
2	If X is a poisson variate such that p(x=0) = p(x=1) = K. Determine K.	2M	1	L1
3	If $f(x) = \begin{cases} \frac{1}{2}(x+1) & -1 < x < 1 \\ 0 & \text{elsewhere} \end{cases}$ Find E(x)	2M	2	L1
4	Write two application of normal distribution.	2M	2	L1
5	Define parameter and Statistic.	2M	3	L1
6	Write about alternative hypothesis.	2M	3	L1
7	Find $F_{0.01}$ (24,19)	2M	4	L1
8	Write the formulae for significance of single mean in t-test.	2M	4	L1
9	Write the definition Harmonic function	2M	5	L1
10	Evaluate $\int_0^{1+i}(x^2 - iy)dz$ along the path y=x^2	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	The probability density function of a variable 'x' is x: 0, 1, 2, 3, 4, 5, 6 P(x): k, 3k, 5k, 7k, 9k, 11k, 13k Find (i) 'k' (ii) p(x < 4) (iii) p(3 < x ≤ 6) iv) Mean v) Variance.	10M	1	L2
	OR			
12	It has been found that 2% of the tools produced by a certain machine are defective what is the probability that in a shipment of 400 such tools. (a) 3% of more (b) 2% or less will prove defective	10M	1	L2
13	Probability density function of random variable 'x' is $f(x) = K(1-x^2)$; $0 < x < 1$. = 0 other wise. Find K, mean and Variance.	10M	2	L2

<table>
<tr><td></td><td>OR</td><td></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.</td><td>10M</td><td>2</td><td>L2</td></tr>
<tr><td>15</td><td>A population consists of five numbers 5,2,6,12,and 11.Consider all possible samples of size two Which can be drawn with out 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>3</td><td>L2</td></tr>
<tr><td></td><td>OR</td><td></td><td></td><td></td></tr>
<tr><td>16</td><td>Random samples of 400 men and 600 women were asked whether they would like to have a flyover near the residence, 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favor of the proposal are same, at 5% level.</td><td>10M</td><td>3</td><td>L2</td></tr>
<tr><td>17</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 the belief that accident conditions were the same during this 10 week period.</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>If u+v $=e^x(\cos y + \sin y)$ then find the analytic function f(z)</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>Evaluate the integrals around c:|z-1|=3 i) $\int_c \frac{e^z}{(z+1)^2} dz$ ii) $\int_c \frac{e^z}{(z+1)^4} dz$</td><td>10M</td><td>5</td><td>L2</td></tr>
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