R20 Regulation *Subject code: 3B3BA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, JUNE 2026

PROBABILITY, NUMERICAL METHODS AND COMPLEX ANALYSIS

(EEE)

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.

Statistical table are allowed

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	Write about Discrete random variables.	2M	1	L1
2	If X_1, X_2 are two random variables and a ,b are constants then $E(aX_1 + bX_2)$?	2M	1	L1
3	Define type I error and type II error.	2M	2	L1
4	Define Right tailed test and Left tailed test.	2M	2	L1
5	Show that $\Delta = E - 1$	2M	3	L1
6	Find the positive root of $x^4 - x - 10 = 0$ by Iteration.	2M	3	L1
7	Evaluate $\int_0^1 x^3 dx$ by Trapezoidal Rule taking n=4.	2M	4	L1
8	Write the formula of Simpson's $\frac{1}{3}$rule,	2M	4	L1
9	If $\varphi(x,y) = x^2 - by^2$ is harmonic then find the value of b.	2M	5	L1
10	Show that analytic function with constant imaginary part is constant.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	A random variable 'x' has the following probability function x: 0 1 2 3 4 5 6 7 P(x): 0 k 2k 2k 3k K^2 $2k^2$ $7k^2+k$ i) Find the value of 'k' ii) Evaluate $p(x < 6)$, $p(x \geq 6)$ iii) $p(0 < x < 5)$	10M	1	L2
	OR			
12	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	1	L2
13	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.	10M	2	L2
	OR			
14	A sample of 64 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.	10M	2	L2

15	Find a positive root of x^3-5x+1=0 by bisection method in 5 stages.	10M	3	L2
	OR			
16	Find a real root of the equation $x.\log_{10}(x) = 1.2$ which lies between 2 and 3 by RegulaFalsi method.	10M	3	L2
17	Assuming that the following values of 'y' belong to a polynomial of degree 4, compute the next three values. x: 0, 1, 2, 3, 4 y: 1, -1, 1, -1, 1	10M	4	L2
	OR			
18	Determine f(x) as a polynomial in 'x' for the following data, using Newton's divided difference formula. x: -4, -1, 0, 2, 5 y: 1245, 33, 5, 9, 1325	10M	4	L2
19	Find the analytic function whose real part. $u(x,y) = x^3 - 3xy^2+3x^2 - 3y^2 + 2x+1$	10M	5	L2
	OR			
20	Use Cauchy's integral formula to evaluate $\int_c \frac{e^z}{(z^2+\pi^2)^2} dz$ where c is the circle $\|z\|=4$.	10M	5	L2