



R20 Regulation

Subject Code: 3B3BA

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**  
(Autonomous, Accredited by NAAC with 'A+' Grade)

**B.Tech III Semester Supplementary Examinations, July 2024**

**PROBABILITY, NUMERICAL METHODS AND COMPLEX ANALYSIS  
(EEE)**

**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.  
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)		CO	Bloom Tx								
1	If X is a poisson variate such that $p(x=0) = p(x=1) = K$ . Determine K	1	L1								
2	If $X = B(n,p)$ then write the conditions under which X tends to a poisson distribution.	1	L1								
3	Define type I error .	2	L1								
4	Define Right tailed test	2	L1								
5	Show that $\Delta = E - 1$	3	L1								
6	Write a short notes on Bisection method.	3	L1								
7	Find the relation between the operators E and D	4	L1								
8	Find the Lagrange's Interpolating polynomial fits the data <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> </tr> <tr> <td>f(x)</td> <td>2</td> <td>1</td> <td>12</td> </tr> </table>	x	0	1	2	f(x)	2	1	12	4	L1
x	0	1	2								
f(x)	2	1	12								
9	Show that an analytic function with constant real part is constant	5	L1								
10	Show that analytic function with constant imaginary part is constant.	5	L1								

**Part-B**

Answer any five from the following questions. (10M X 5=50Marks)			
11	A continuous random variable 'X' is defined by $f(x) = \begin{cases} \frac{1}{16}(3+x)^2, & \text{if } -3 \leq x \leq -1 \\ \frac{1}{16}(6-2x^2), & \text{if } -1 \leq x < 1 \\ \frac{1}{16}(3-x)^2, & \text{if } 1 \leq x \leq 3 \\ 0 & \text{elsewhere} \end{cases}$ Verify that f(x) is a density function & also find the Mean of 'x'. [10]	1	L2
<b>OR</b>			
12	Find the mean and S.D of the normal distribution in which 7% of the items are under 35 and 89% are under 63. [10]	1	L2

13	A simple sample of the heights of 6400 English men has a mean of 67.585 inches and a S.D of 2.56 inches while a simple sample of height of 1600 Australians has mean of 68.55 and a S.D of 2.52. D the data indicate the Australians are on the average taller than Englishmen use 1% l.o.s. [10]	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. [10]	2	L2												
15	Using Bisection method, find a +ve real root of the equation $x = e^{-x}$ , correct to 3 decimals. [10]	3	L2												
OR															
16	Find a positive root of $x^3 - x - 10 = 0$ upto 4 decimal places accuracy by N-R method. [10]	3	L2												
17	Assuming that the following values of 'y' belong to a polynomial of degree 4, compute the next three values. [10]	4	L2												
<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>y</td> <td>1</td> <td>-1</td> <td>1</td> <td>-1</td> <td>1</td> </tr> </tbody> </table>				x	0	1	2	3	4	y	1	-1	1	-1	1
x	0	1	2	3	4										
y	1	-1	1	-1	1										
OR															
18	A. Evaluate $\int_0^1 x^3 dx$ with five sub-intervals by Trapezoidal rule. [5] B. Evaluate $\int_0^1 \frac{1}{1+x^2} dx$ using Simpson's $\frac{3}{8}$ rule taking $h = \frac{1}{6}$ [5]	4	L2												
19	If $f(z) = \frac{1}{2} \log(x^2 + y^2) + i \tan^{-1}\left(\frac{px}{y}\right)$ is an analytic function, then find the value of p. [10]	5	L2												
OR															
20	If $f(z)$ is a Regular function of $z$ , then prove that $\left[\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right]  f(z) ^2 = 4 f'(z) ^2$ [10]	5	L2												

NOTE: STATISTICAL TABLES ARE ALLOWED.