



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

**PROBABILITY, NUMERICAL METHODS AND COMPLEX ANALYSIS**  
**(Electrical and Electronics Engineering)**

**Maximum Marks: 70**

**Date:02.12.2024**

**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.

**Part-A**

All the following questions carry equal marks (10X2M=20) Marks		CO	Bloom Tx
1	Explain Discrete random variables	1	L1
2	If $X_1, X_2$ are two random variables and a, b are constants then $E(aX_1 + bX_2)$ ?	1	L1
3	Write the test statistic of single mean in large samples?	2	L1
4	Define type II error.	2	L1
5	Write a short note on Regula- falsi method.	3	L1
6	Write a short note on Bisection method.	3	L1
7	Find the relation between the operators E and D.	4	L1
8	Write the formula for Simpson's 3/8 rule?	4	L1
9	Define Analytic Function.	5	L1
10	Define Harmonic Function.	5	L1

**Part-B**

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx																
11	The probability density function of a variable 'x' is <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 2px 10px;">x</td> <td style="padding: 2px 10px;">0</td> <td style="padding: 2px 10px;">1</td> <td style="padding: 2px 10px;">2</td> <td style="padding: 2px 10px;">3</td> <td style="padding: 2px 10px;">4</td> <td style="padding: 2px 10px;">5</td> <td style="padding: 2px 10px;">6</td> </tr> <tr> <td style="padding: 2px 10px;">P(x)</td> <td style="padding: 2px 10px;">K</td> <td style="padding: 2px 10px;">3k</td> <td style="padding: 2px 10px;">5k</td> <td style="padding: 2px 10px;">7k</td> <td style="padding: 2px 10px;">9k</td> <td style="padding: 2px 10px;">11k</td> <td style="padding: 2px 10px;">13k</td> </tr> </table> Find (i) 'k' (ii) $p(x < 4)$ (iii) $p(3 < x \leq 6)$ [10M]	x	0	1	2	3	4	5	6	P(x)	K	3k	5k	7k	9k	11k	13k	1	L2
x	0	1	2	3	4	5	6												
P(x)	K	3k	5k	7k	9k	11k	13k												
OR																			
12	If mean = 70, standard deviation is 16. Find (i) $p(38 \leq x \leq 46)$ , (ii) $p(62 \leq x \leq 86)$ [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 real root for $x e^x = \cos x$ , using Regula Falsi method [10M]	3	L2												
OR															
16	Evaluate $\sqrt{28}$ to four decimal places by Newton's Raphson Method. [10M]	3	L2												
17	Use Newton forward interpolation formula to compute the pressure of the steam at temperature $142^\circ\text{C}$ from the following steam table [10M]	4	L2												
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>temp</td> <td>140</td> <td>150</td> <td>160</td> <td>170</td> <td>180</td> </tr> <tr> <td>Pressure</td> <td>3.685</td> <td>4.854</td> <td>6.302</td> <td>8.076</td> <td>10.225</td> </tr> </table>	temp	140	150	160	170	180	Pressure	3.685	4.854	6.302	8.076	10.225		
temp	140	150	160	170	180										
Pressure	3.685	4.854	6.302	8.076	10.225										
OR															
18	A. Evaluate $\int_0^1 x^3 dx$ with five sub-intervals by Trapezoidal rule [5M] B. Evaluate $\int_0^1 \frac{1}{1+x^2} dx$ using Simpson's $\frac{3}{8}$ rule taking $h = \frac{1}{6}$ [5M]	4	L2												
19	If $u + v = e^x (\cos y + \sin y)$ then find the analytic function $f(z)$ . [10M]	5	L2												
OR															
20	State and prove Cauchy's integral theorem. [10M]	5	L2												