



Regulation R20

Subject Code: 3B3BA

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

**B.Tech. III Semester Supplementary Examinations, July 2022**

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

**Maximum Marks: 70**

**Date:19.07.2022 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)

- 1 Define poisson distribution
  - 2 If the mean and variance of the binomial variate are 12 and 4 then write binomial distribution
  - 3 Write about Null Hypothesis?
  - 4 Define critical region.
  - 5 Write a short notes on Regula- falsi method.
  - 6 Write a short notes on Bisection method.
  - 7 Find the relation between the operators E and D
  - 8 Find the Lagrange's Interpolating polynomial fits the data
- |      |   |   |    |
|------|---|---|----|
| x    | 0 | 1 | 2  |
| f(x) | 2 | 1 | 12 |
- 9 Show that an analytic function with constant real part is constant
  - 10 Find 'k' such that  $f(x, y) = x^3 + 3kxy^2$  be harmonic.

**Part-B**

Answer any five from the following questions.

(5X10M=50Marks)

- 11 The probability density function of a variable 'x' is [10]

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)  $p(3 < x \leq 6)$

OR

- 12 If mean = 70, standard deviation is 16. Find (i)  $p(38 \leq x \leq 46)$ , (ii)  $p(62 \leq x \leq 86)$ . [10]
- 13 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]

OR

14 A coin was tossed 400 times and returned heads 216 times. Test the hypothesis that the coin is unbiased. Use a 0.05 level of significance. [10]

15 Find a positive root of  $x^3 - x - 1 = 0$  correct to two decimal places by Bisection method. [10]

OR

16 Find a real root for  $x \tan x + 1 = 0$  using Newton Raphson method. [10]

17 Use Newton forward interpolation formula to compute the pressure of the steam at temperature  $142^{\circ}\text{C}$  from the following steam table. [10]

temp	140	150	160	170	180
Pressure	3.685	4.854	6.302	8.076	10.225

OR

18 (i) Evaluate  $\int_0^1 x^3 dx$  with five sub-intervals by Trapezoidal rule. [5]

(ii) Evaluate  $\int_0^1 \frac{1}{1+x^2} dx$  using Simpson's  $\frac{3}{8}$  rule taking  $h = \frac{1}{6}$  [5]

19 Show that  $u(x, y) = e^x \cos y$  is harmonic and find its harmonic conjugate  $v(x, y)$ , also the analytic function. [10]

OR

20 Evaluate  $\int_c f(z) dz$  where  $f(z) = \frac{z+2}{z}$  where  $c$  is [10]

i) The semicircle  $z=2e^{i\theta}$  where  $\theta$  varies from 0 to  $\pi$

ii) The semicircle  $z=2e^{i\theta}$  where  $\theta$  varies from 0 to  $-\pi$