R17 Regulation *Subject: 1B2AC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade

B.Tech I Year II Semester Supplementary Examinations, October 2022

MATHEMATICS-III

(Common to CE, EEE, ME, ECE, CSE & IT)

Maximum Marks: 70 Date:15.10.2022 Duration: 3hours

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. A die is tossed thrice. A success is getting 1 or 6 on a toss. Find the mean and variance of the number of successes.
2. A die is tossed until 6 appears. Find the probability that it must be cast more than 5 times
3. A sample of size 10 was taken from a population S.D of sample is 0.03. Find the maximum error with 99% confidence
4. A random sample of 200 measurements from a large population gave a mean value of 50 and S.D of 9. Determine the 95% confidence interval for the mean of the population
5. Explain about One tailed and Two tailed tests.
6. In a sample of 500 from a village in Rajasthan 280 are found to be wheat eaters and the rest rice eaters can we assume that the both articles are equally popular.
7. Write merits and demerits of Newton-Rapson method.
8. Explain the iterative method approach in solving the problems.
9. Use trapezoidal rule with n = 3 to estimate $\int_0^1 \frac{dx}{1+x^2}$
10. What is the Simpson's 3/8 rule.

Part-B

Answer all the following questions (5X10M=50M)

11. If the probability density function of a random variable 'X' is given by

    $f(x) = \{k(1-x^2)\ 0 < x < 1$, $f(x) = 0$ otherwise

    Find (i) K (ii) Mean (iii) Variance (iv) Cumulative distribution function of X. (10M)

(OR)

12. Fit a binomial distribution to the following data (10M)

x	0	1	2	3	4	5
y	2	14	20	34	22	8

13. Prove that for a random sample of size n, $x_1, x_2, \ldots\ldots x_n$ taken from an infinite population

$S^2 = \frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x})^2$ is not unbiased estimator of the parameter σ^2 but

$s^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2$ is unbiased. (10M)

(OR)

14. A population consists of six numbers 4, 8, 12, 16, 20, 24. Consider all possible samples of size two that can be drawn with replacement

Find (a) The population mean (b) The population S.D.

(c) The mean of the sampling distribution of the means

(d) The S.D. of the sampling distribution of the means (10M)

15. In a referendum submitted to the student's body at a university 850 men and 566 women voted 530 of the men and 304 of the women voted in favor of a matter. does this indicate a significant difference of the opinion on the matter at least 1% level ,between men and women and students. (10M)

(OR)

16. A manufacturer claimed that at least 95% of the equipment which he supplied to factory conformed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty. Test his claim 5 % level of significance. (Table Value 1.645) (10M)
17. Use Gauss-Seidel iteration method to solve the system (10M)

$10x + y + z = 12$; $2x + 10y + z = 13$; $2x + 2y + 10z = 14$

(OR)

18. Fit a polynomial of second degree to the data points given in the following table (10M)

x	2	4	6	8	10
y	3.07	12.85	31.47	57.38	91.29

19. Find f(2.5) using Newtons forward formula (10M)

X	0	1	2	3	4	5	6
Y	0	1	16	81	256	625	1296

(OR)

20. Use Lagranges interpolation formula to find the polynomial of the following table (10M)

x	1	2	4
P(x)	1	27	64