*R20 Regulation* *Subject code:3B3GB*

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

## B.Tech III Semester Regular/Supplementary Examinations, March/April 2023

## STATISTICAL METHODS

(Common to CSE (AI&ML) & CSE(DS))

***Maximum Marks: 70*** Date:29.03.2023 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 Write any two merits and demerits of Mean.
2 Define Classification of data.
3 Define Skewness and Kurtosis.
4 Find Range to 23,6,4578,12,89,1,5.
5 Define Population and sample.
6 A random sample of size 100 has a standard deviation of 5. What can you say about the maximum error with 95% confidence?
7 Define the Null Hypothesis and Alternative Hypothesis.
8 Explain types of errors.
9 Write the types of correlation.
10 Properties of regression coefficients.

Part-B

Answer All the following questions. (5X10M=50Marks)

11 Explain the Functions of Statistics. 10M

OR

12 Find the median to the following table data 10M

| Classes | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
|---|---|---|---|---|---|---|---|
| frequency | 23 | 6 | 45 | 67 | 4 | 9 | 15 |

13 Explain Skewness and methods for measuring Skewness. 10M

OR

14 Calculate Quartile Deviation and its co-efficient to the following data. 10M

| Classes | 0-15 | 15-30 | 30-45 | 45-60 | 60-75 | 75-90 | 90-105 |
|---|---|---|---|---|---|---|---|
| Frequency | 6 | 15 | 16 | 3 | 11 | 13 | 10 |

15 A population consists of five numbers 3, 4, 7, 9, and 12. Consider all possible samples of size two, which can be drawn with replacement from this population. Find: 10M

i. The mean of the population.

ii. The standard deviation of the population;

iii. The mean of the sampling distribution of means;

iv. The standard deviation of the sampling distribution of means

OR

16 The mean and the standard deviation of a population are 11,795 and 14054 respectively. If the size of the sample is 50, find a 95% confidence interval for the mean. 10M

17 A) In two large populations, there are 30% and 25% respectively of fair-haired people. Is this difference likely to be hidden in samples of 1200 and 900 respectively from the two populations? 5M

B) In a random sample of 60 workers, the average time taken by them to get to work is 33.8 minutes with a standard deviation of 6.1 minutes. Can we reject the null hypothesis $\mu = 32.6$ minutes in favor of an alternative null hypothesis $\mu > 32.6$ at 1% level of significance? 5M

OR

18 A) Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results. 5M

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Horse A | 28 | 30 | 32 | 33 | 33 | 29 | 34 |
| Horse B | 29 | 30 | 30 | 24 | 27 | 29 | |

Test whether the two hours have the same running capacity.

B) A random sample of 500 Apples taken from a large consignment of 60 was found to be bad, obtaining the 98% confidence limit for the percentage number of bad apples in the consignment. 5M

19 Find Spearmen's Rank coefficient of correlation from the following data.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X | 78 | 77 | 85 | 88 | 87 | 82 | 81 | 77 | 76 | 83 | 97 | 93 |
| Y | 84 | 82 | 82 | 85 | 89 | 90 | 88 | 92 | 83 | 89 | 98 | 99 |

10M

OR

20 Four processes A, B, C, and D are tested to see whether their outputs are equivalent. The following observations of output are made. 10M

| | | | |
|---|---|---|---|
| A | 6 | 5 | 5 |
| B | 7 | 5 | 4 |
| C | 3 | 3 | 3 |
| D | 8 | 7 | 4 |

Carry out the analysis of variance and state your conclusions.