



Date: 16-06-2022

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

SECTION - A

Answer all the questions.

(10 X 2 =20)

1. Define Null and Alternative Hypothesis.
2. Define Two-tailed test with an example.
3. State Monotone Likelihood ratio property.
4. Define Uniformly Most Powerful test.
5. Mention any two properties of LRT.
6. Define likelihood ratio test.
7. What are the applications of F-distribution in test of significance?
8. How to calculate the expected frequencies in chi-square test?
9. Mention any two advantages of parametric tests.
10. State the applications of Mann-Whitney U test.

SECTION- B

Answer any FIVE questions.

(5 X 8 = 40)

11. Let p be the probability that a coin will fall head in a single toss. In order to test

$$H_0 : p = \frac{1}{2} \text{ against } H_1 : p = \frac{3}{4}, \text{ the coin is tossed 5 times and } H_0 \text{ is rejected if more than 3}$$

heads are obtained. Find the probability of Type I error and power of the test.

12. Describe the steps involved in testing statistical hypothesis.
13. Prove that a random sample of n observations on $X \sim B(m, \theta)$ satisfies MLR property.
14. Derive a likelihood ratio test for the mean of a normal population.
15. Explain the concept of SPRT.
16. Explain the test procedure for testing equality of variances of two normal populations.
17. The life time of electric bulbs for a random sample of 10 from a large consignment gave the following data:

Item	1	2	3	4	5	6	7	8	9	10
Life in'000 hrs	4.2	4.6	3.9	4.1	5.2	3.8	3.9	4.3	4.4	5.6

Can we accept the hypothesis that the average life time of bulbs is 4000 hours?

18. Explain Kolmogorov Smirnov test.

SECTION- C

Answer any TWO questions.

(2 X 20 = 40)

19. State and prove Neymann-Pearson lemma.

20.a) Discuss the merits and demerits of non-parametric test.

b) Perform Kruskal-Wallis test for the following data on three college students performance:

College A	25	70	60	85	95	90	80
College B	60	20	30	15	40	35	
College C	50	70	60	80	90	70	75

21. Derive the LRT for testing the equality of means of two independent normal populations with equal variance.

22. To compare the prices of a certain commodity in two towns' nine shops were selected at random in each town. The following figures give the price found:

Town A	61	56	63	56	63	59	56	44	61
Town B	55	47	59	51	61	57	54	64	58

Test whether the average price can say to be the same in the two towns.

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