

Faculty of Science
B.Sc (Statistics) II-Year, CBCS-IV Semester
Regular Examinations –June/July, 2022
PAPER-IV: Statistical Inference

Time: 3 Hours

Max Marks: 80

Section –A

I. Answer any eight of the following (8X4=32 Marks)

1. Define Null and Alternate Hypothesis.
2. Write the statement of Neyman's Factorization theorem.
3. Obtain the best critical region for testing $H_0: \lambda = \lambda_0$ against $H_1: \lambda = \lambda_1$ for the Poisson population.
4. Explain the procedure for testing the hypothesis in large samples.
5. Explain test for Single Mean in large samples.
6. Define Order Statistics-Write their distributions.
7. Explain χ^2 test for goodness of fit.
8. Explain F-test for equality of population variances.
9. Explain paired t- test.
10. Explain measurement scales in detail.
11. Explain sign test in one sample and two samples.
12. 25 heads are observed of 37 throws of a coin. Test whether the coin is unbiased if the total runs are 13.

Section –B

II Answer the following questions. (4X12= 48 Marks)

13. (a) State and prove Neyman Pearson Lemma for testing simple null hypothesis against a simple alternative hypothesis.

(OR)

- (b) If p be the probability of success getting head in a single toss the test $H_0: p = 1/2$ against $H_1: p = 3/4$. The coin is tossed five times and H_0 is rejected if more than 3 heads are obtained. Find the probability of Type-I and Type-II errors.

14. (a) Explain the large sample test procedure for testing the difference of two population proportions.

(OR)

(b) Explain the test procedure for testing the difference between standard deviations for large samples.

15. (a) Write the procedure in detail for testing the hypothesis in difference Of means for small samples.

(OR)

(b) State the conditions for the validity of chi-square test and explain χ^2 test For independence of attributes

16. (a) Explain Mann-Whitney U-test.

(OR)

(b) Explain the procedure of Wald Wolfowitz Run test and also explain the Median test.

Faculty of Science

B.Sc. (Statistics) II-Year, CBCS –IV Semester Backlog Examinations –Jan, 2023

PAPER: Statistical Inference

Time: 3 Hours

Max Marks: 80

Section-A

- I. Answer any EIGHT of the following questions (8x4=32 Marks)
1. Define the terms Statistical Hypothesis, Null and Alternative Hypothesis.
 2. Explain types of errors.
 3. Define level of significance and Power of a test with examples.
 4. Explain large sample test for single mean.
 5. Define Fisher's Z-transformation for population correlation coefficient.
 6. Define order statistics. State their distributions.
 7. Describe χ^2 test for specified variance.
 8. Explain the test procedure for 2x2 contingency table.
 9. Explain t-test for related samples.
 10. Define parametric and non-parametric tests.
 11. Discuss the uses of central limit theorem in testing.
 12. Explain median test procedure.

Section-B

- II. Answer the following questions (4x12=48 Marks)
- 13.(a) Let 'p' denote the probability of getting a head when a given coin is tossed once. Suppose that the hypothesis $H_0: p = 0.5$ is rejected in favor $H_1: p = 0.6$, if 10 tosses result in 7 or more heads. Calculate the probabilities of type I and type II errors.
- (OR)
- (b) State and prove Neyman-Pearson lemma.
- 14.(a) Explain large sample test for difference of proportions.
- (OR)
- (b) Explain the large sample test for testing significant difference between two sample standard deviations.
- 15.(a) Explain the F-test for equality of population variances.
- (OR)
- (b) Explain small sample test for testing the significance of difference of means.
- 16.(a) Explain Wald Wolfowitz's runs test.
- (OR)
- (b) Explain Wilcoxon- Mann Whitney U test for independence of two samples.

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B.Sc (Statistics) II-Year, CBCS-IV Semester Regular Examinations –June, 2023**PAPER: Statistical Inference**

Time: 3 Hours:

Max Marks: 80

Section –AI. Answer any *eight* of the following questions. (8X4=32 Marks)

1. Define the terms: (i) Types of errors (ii) power of the test.
2. Write the statement of Neyman's Factorization theorem.
3. Explain one tailed test and two tailed tests.
4. Explain the procedure of testing the significance of single proportion in large sample.
5. Define Order statistics. State their distributions.
6. What do you know about Fisher's Z-transformations?
7. What is Yate's correction and how to apply it.
8. Explain paired t-test.
9. Explain χ^2 test for independence of attributes.
10. Define a run and length of a run.
11. Explain Nominal Scale and Ordinal Scale.
12. Explain uses of central limit theorem in testing.

Section –B

II. Answer the following questions. (4X12=48 Marks)

13. (a) Obtain the best critical region for testing $H_0 : \mu = \mu_0$ against $H_1 : \mu = \mu_1$ for the normal population.
(OR)
(b) Define Null and alternative hypothesis. State and prove Neyman Pearson Lemma.
14. (a) Explain large sample test for equality of two population Correlation coefficients by using Fisher's Z transformation.
(OR)
(b) Explain the test procedure for testing the difference between two sample proportions for large samples.
15. (a) The weights of 10 males are given below.
62 64 67 71 69 68 70 71 72 & 66. Test whether the average weight of the males is below 66 kgs. Find the 95% confidence limits of the population mean weight of the males.
(Table value of $t_{(5\%, 9)} = 1.838$)
(OR)
(b) Explain in detail test procedure for testing the hypothesis of two different population means in small samples.
16. (a) What are the advantages and disadvantages of non-parametric methods over parametric methods and also explain sign test
(OR)
(b) Explain Wilcoxon signed rank test for paired sample.
