

Reg. No. :

Name :

Fourth Semester B.Sc. Degree Examination, August 2022

First Degree Programme under CBCSS

Statistics

Complementary Course for Psychology

ST 1431.5 – STATISTICAL METHODS FOR PSYCHOLOGY — IV

(2019 Admission onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – A

Answer **all** questions. Each question carries **1** mark.

1. Differentiate parameter and statistic.
2. Define sampling distribution.
3. What is the problem of point estimation.
4. What you mean by hypothesis.
5. Define composite hypothesis.
6. What do you mean by large sample test.
7. Give the test statistic for testing the mean of a population when n is large and σ is known.
8. Give any two applications of paired-t test?

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9. When do you opt non-parametric test.
10. Define run in a non-parametric test.

(10 × 1 = 10 Marks)

SECTION – B

Answer **any eight** questions. Each question carries **2** marks.

11. What you mean by statistical inference.
12. Distinguish between standard deviation and standard error.
13. Define F-distribution.
14. A random sample of size 17 from a normal population is found to have mean 4.7 and $s^2=5.76$. Find a 90% confidence interval for the mean of the population.
15. Define statistical hypothesis.
16. Distinguish between null and alternative hypothesis.
17. What is meant by critical region in testing of hypothesis and what considerations are given to determine it?
18. Explain steps in statistical testing procedure.
19. Define the two kinds of errors in testing a statistical hypothesis.
20. Distinguish between one-tailed and two-tailed tests.
21. Give an example of a statistic following normal distribution.
22. What are the conditions for using chi square for testing agreement between the theoretical frequencies and observed frequencies?
23. Give two statistics following t distribution.

24. Describe the statistic for testing correlation coefficient.
25. What is the difference between sign test and Wilcoxon's signed rank test?
26. Describe sign test.

(8 × 2 = 16 Marks)

SECTION – C

Answer **any six** questions. Each question carries **4** marks.

27. Describe χ^2 - distribution and state its uses.
28. What are the assumptions made for the application of t distribution in the small sample test?
29. State the relation between χ^2 , t and F distributions.
30. Distinguish between randomised and non-randomised test.
31. Explain how will you test the hypothesis that the given sample is drawn from a normal population with given mean.
32. Obtain the mean and variance of χ^2 distribution with n df.
33. Random samples of sizes 500 and 400 are found to have means 11.5 and 10.9 respectively. Can the samples be regarded as random sample drawn from the population whose standard deviation is 5?
34. Explain the procedure of testing the hypothesis that a proportion has a specified value, provide an example.
35. A random sample of 25 pairs of observations gave correlation coefficient (r) = 0.5. Can it be regarded as drawn from a population with correlation coefficient 0.6.
36. A sample of 10 observations gives a mean equal to 38 and standard deviation 4. Can we concluded that the population mean is 40.
37. Distinguish between parametric and non—parametric tests.
38. Define median test.

(6 × 4 = 24 Marks)

SECTION – D

Answer any 2 questions. Each question carries 15 marks.

39. (a) Explain the process of constructing confidence interval for the proportion has a specified value.
(b) If the mean age at death of 64 men engaged in an occupation is 52.4 years with standard deviation of 10.2 years. What are the 98% confidence interval for the mean age of all men in that occupation.
40. (a) Define (1) critical region (2) significance level and (3) power.
(b) To test the hypothesis that the probability of a coin showing head is p_0 against the hypothesis that the probability is p_1 ($p_1 > p_0$), it is decided to toss the coin n times and reject the hypothesis if it shows head in more than γ tosses, (1) what is the test statistic (2) critical region (3) power of the test (4) type two error and significance level.
41. (a) Explain the test procedure of testing the equality of two proportions.
(b) In a sample of 600 men from a certain city 400 are found as smokers. In 900 from another city 450 are smokers, Do the data indicate that the cities are significantly different as far as smoking habits are concerned ($\alpha = 0.05$).
42. (a) Explain how t test is used for paired comparison of difference of means.
(b) A random sample of pigs fed on diet A over a period gave the following values, $\bar{x} = 6, s = 3.8, n = 8$. Another sample fed diet B gave the $\bar{x} = 9, s = 4.15, n = 5$. Test whether the diets A and B differ significantly in their means.
43. (a) Define contingency table and give the test procedure for testing the independence of attributes.
(b) What are the important applications of F-distribution.
(c) Describe interval estimation.
44. (a) Discuss the advantages of non-parametric statistical test procedures.
(b) Describe Wald-Wolfowitz run test with example.
(c) Explain McNeamer's test.

(2 × 15 = 30 Marks)