



23124433

QP CODE: 23124433

Reg No : .....

Name : .....

**B.Sc DEGREE (CBCS) REGULAR EXAMINATIONS, MAY 2023**

**Fourth Semester**

B.Sc Psychology Model I

**Complementary Course - ST4CMT24 - STATISTICS -STATISTICAL INFERENCE**

2021 Admission Only

C14E6BCA

Time: 3 Hours

Max. Marks : 80

**Part A**

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. Explain composite hypothesis with an example.
2. What is power in a statistical hypothesis testing?
3. Write a note on Standard Error.
4. Define (i) standard error (ii) sampling distribution
5. What is the test statistic for testing the hypothesis concerning the equality of means of two populations based on large samples when S.D is unknown and equal.
6. Define Chi-square test statistic.
7. How is the d.f of the Chi-square test for goodness of fit determined?
8. Give the statistic under the null hypothesis of testing the difference of means of two normal population for small sample, when  $\sigma$  unknown.
9. What is paired t test?
10. How to test a hypothesis about a proportion when  $\sigma$  known.
11. Explain small sample tests with example.
12. Explain the use of Students t distribution.

(10×2=20)

**Part B**

*Answer any **six** questions.*

*Each question carries **5** marks.*





13. What do you understand by the terms testing of hypothesis and level of significance?
14. Discuss in brief the terms null hypothesis and alternative hypothesis.
15. Distinguish between the two types of errors in testing of hypothesis.
16. The height of students studying in college classes is believed to be distributed with S.D 10 cm. A sample of 100 students have their mean heights 168.8 cm. Can we accept the hypothesis that the mean height of the students is 170 cm. (significance level = 0.05)
17. In a sample of 100 people the number of those suffering from T.B was found to be 5. Does this contradict the assumption that the proportion of T.B patients in the whole population is less than 0.04. ( $\alpha = 0.05$ )
18. Derive the test statistic for testing equality of proportions in two populations.
19. Explain the methods for testing the equality of means of two populations pointing out the modifications to be made when samples are small and large and the variances are known.
20. Explain the procedure of testing the significance of the value of mean of a population. (small sample case only).
21. Explain the Chi square test for variance.

(6×5=30)

### Part C

Answer any **two** questions.

Each question carries **15** marks.

22. In a random sample of 600 males in Jaipur, 400 were found to be smokers while in another random sample of 900 females in Delhi, 450 were found to be smokers. Discuss whether the data reveal a significant difference in Jaipur to Delhi so far as the proportion of smokers is concerned.
23. Below is given the distribution of hair colours for either sex in a university.

Hair colour	Fair	Red	Medium	Dark	Jet black	Total
Boys	592	119	849	504	36	2100
Girls	544	97	677	451	14	1783
Total	1136	216	1526	955	50	3883

Test the homogeneity of hair for either sex at 5% significance level.





24. (a) Explain the procedure for testing mean of a normal population with known standard deviation in small sample case.
- (b) The mean of 10 readings on the length of a given rod is 20 inches. The standard deviation of errors of measurement is known to be 0.1 inches. Does the result contradict the assumption that the length of the rod is 19.9 inches given that the errors of measurement follow normal distribution. ( $\alpha = 0.05$ )
25. (a) Give the applications of Chi square distribution.
- (b) The manufacturer of an automatic sugar bagging machine claims that the variance of the bag weights is less than 0.01. Do the following observations of the weights of a randomly chosen sample of bags support the claim.
- 10.1, 9.8, 10.1, 9.9, 10, 9.7, 9.9, 10, 9.8

(2×15=30)

