B.Sc DEGREE (CBCS) EXAMINATION, MAY 2019

Fourth Semester

B.Sc Psychology Model I

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

2017 ADMISSION ONWARDS

17348551

Maximum Marks: 80   **Time: 3 Hours**

Part A

Answer any **ten** questions.

Each question carries **2** marks.

1. What is meant by the test of statistical hypothesis?

2. What are the two types of errors in testing of hypothesis

3. Define power of a test.

4. Define (i) standard error (ii) sampling distribution

5. Give the test statistic and critical regions for testing the hypothesis that a proportion has a specified value.

6. Define the test statistic for testing equality of proportions in two populations based on large sample.

7. How is the d.f of the Chi-square test for goodness of fit determined?

8. A sample of 20 items has a mean 42 units and S. D 5 units. Test the hypothesis that it is a random sample from a normal population with mean 46 units

9. Give the statistic under the null hypothesis of testing of mean of a population has a specified value for small sample, when σ unknown

10. Give the statistic under the null hypothesis of testing the difference of means of two normal population for small sample, when σ unknown.

11. Give the test statistic for binomial test for proportion

12. Explain the use of Students t distribution.

(10×2=20)

Part B

Answer any **six** questions.

Each question carries **5** marks.

13. Explain simple and composite hypothesis with an example.

14. Explain the procedure involved in testing of hypothesis.

15. Distinguish between one tailed and two tailed test?

16. How do you determine the critical region for testing H0: $\mu=\mu$ $\mu = \mu_0$ using large sample tests. What modifications will you make depending on the alternative hypothesis?

17. A sample of 400 observations were taken from a population with S.D 15.If the mean of the sample is 27, test whether the hypothesis that the mean of the population is less than 24.

18. Describe the Chi-square test for independence of attributes, stating clearly the conditions for its validity.

19. Is there a difference between the means between individuals with Down's syndrome and normal individuals?
$\bar{x}$=4.5, n1= 12, $\sigma2_1$=1, $\bar{y}$ =3.4, n2= 15, $\sigma2_2$=1.5, α =0.05

20. Discuss briefly the different applications of Chi- square as a test statistic.

21. Explain small sample tests. Give their application roles with illustration

$(6\times5=30)$

Part C

Answer any **two** questions.

Each question carries **15** marks.

22. Chi-square test is a test of independence, homogeneity and goodness of fit. Discuss briefly.

23. The following data was obtained in an investigation about the effect of vaccination for small pox.

	Vaccinated	Not vaccinated	Total
Attacked by small pox	3	12	15
Not attacked	8	5	13
Total	11	17	28

Examine whether vaccination is effective in preventing small pox.

24. 12 rats were given a high protein diet and another set of 7 rats given a low protein diet. The gain in weight in grams observed in the two sets are given below:

High protein diet: 13   14   10   11   12   16   10   8   11   12   9   12

Low protein diet: 7   11   10   8   10   13   9

Examine whether the high protein diet is superior to the low protein diet at 5% level of significance.

25. (a) Give the applications of Chi square distribution.

(b) The manufactures 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

$(2×15=30)$