QP CODE: 21101057

Reg No   : ....

Name   : ....

B.Sc DEGREE (CBCS) EXAMINATION, MARCH 2021

Fourth Semester

B.Sc Psychology Model I

Complementary Course - ST4CMT24 - STATISTICS -STATISTICAL INFERENCE

2017 Admission onwards

52D8734D

Time: 3 Hours

Max. Marks : 80

Part A

*Answer any **ten** questions.*

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

1. Explain Type II error.

2. Define power of a test.

3. What do you mean by one tailed test?

4. What is the test statistic for testing a hypothesis concerning the mean of the large sample population when S.D is known?

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 known?

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

7. What do you mean by Chi-square test of independence?

8. Give the test statistic for fortesting the hypothesis $H_0: \mu = 27$ Vs $H_1: \mu < 27$. The population is normally distributed. $\alpha=0.05, n=12, \sigma=2.2$.

9. Give the statistic under the null hypothesis of testing the difference of means of two normal populations for small sample, when σ known

10. What is paired t test?

11. Give the test statistic for testing $H_0: \sigma = \sigma_0$

12. Give the test statistic for testing the equality of standard deviations of two normal populations.

(10×2=20)

Turn Over

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. Define statistical test.

16. Explain the terms 'null hypothesis', 'degrees of freedom', 'level of significance' used in Chi-square test.

17. What are the conditions for using Chi-square test for testing agreement between theoretical frequencies and observed frequencies?

18. Describe how χ2 distribution used for testing homogeneity.

19. A job placement director claims that the average starting salary for nurses is $24,000. A sample of 10 nurses has a mean of $23,450 and a standard deviation of $400. Is there enough evidence to reject the director's claim at α = 0.05.

20. A group of seven week-old chickens reared on a high protein diet weigh 12,15,11,16,14,14 and 16 ounces, a second group of five chickens similarly treated except that they receive a low protein diet weighted 8,10,14,10 and 13 ounces. Test whether there is sufficient evidence that additional protein has increased the weight of the chickens.

21. Write the steps for testing the hypothesis for the population proportion of a specified characteristic under small sample test.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. The average hourly wage of a sample of 150 workers in a plant 'A' was Rs. 2.56 with a standard deviation of Rs. 1.08 the average wage of a sample of 200 workers in plant 'B' was Rs. 2.87 with a standard deviation of Rs. 1.28. Can an applicant safely assume that the hourly wages paid by plant 'B' are higher than those paid by plant 'A'?

23. Five hundred students in a school were graded according to their intelligence and the economic conditions of their home. Examine whether there is any association between economic conditions at home and intelligence. (Given for 1 d.f. χ2 = 3.84 at 5% significance level)

Intelligence

Economic conditions		Good	Bad	Total
	Rich	85	75	160
	Poor	165	175	340
	Total	250	250	500

24. (a) Explain the procedure for testing the equality of standard deviations of two normal populations, stating assumptions clearly.

(b) Two random samples drawn from two normal populations are

Sample i: 20, 16, 26, 27, 23, 22, 18, 24, 25, 19

Sample ii: 27, 33, 42, 35, 32, 34, 38, 28, 41, 43, 30, 37

Obtain estimates of the variances of the populations and test whether the two populations have the same variances.

25. Explain small sample tests with example. Give their application roles with illustration.

(2×15=30)