20101057

B.Sc DEGREE (CBCS) EXAMINATION, MARCH 2020

Fourth Semester

B.Sc Psychology Model I

Complementary Course - ST4CMT24 - STATISTICS -STATISTICAL INFERENCE

2017 ADMISSION ONWARDS

242F858B

Time: 3 Hours   Marks: 80

Part A

*Answer any **ten** questions.*

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

1. Which hypothesis decides whether a test is one tailed or two tailed?

2. Define the size of a test.

3. What do you mean by two tailed test?

4. What is the standard error for testing the equality of means of two populations based on large samples when the standard deviations are known?

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

6. 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?

7. Define Chi-square test statistic.

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

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. Give the test statistic for testing the equality of means based on paired observations.

11. How to test a hypothesis about a proportion when σ known.

12. Explain small sample tests with example.

(10×2=20)

*Answer any **six** questions.*

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

13. Distinguish between the two types of errors in testing of hypothesis.

14. What are significance level and power of a test?

15. What is the contribution of standard error in testing of hypothesis?

16. Explain how to test the significance of a single proportion.

17. Explain how a Chi-square distribution is used to test the independence of two attributes given the contingency table. State clearly on what principles the expected cell frequencies are calculated.

18. What do you mean by Chi-square test of 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. The SD of the scores of 10 candidates in an examination is 3.5. Is their justification in the belief that the SD of the population is less than 3.

21. The standard deviation of two samples of sizes 10 and 14 from two normal populations are 3.5 and 3 respectively. Examine whether the standard deviations of the populations are likely to be equal.

(6×5=30)

Part C

*Answer any **two** questions.*

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

22. From a population with unknown S.D a sample of size 100 was taken and its mean and S.D were found to be 195 and 50. Examine whether the hypothesis that the mean of the population is 200 maybe justified at 1% level of significance. If the sample size is unknown and a statistician has rejected the hypothesis at 5% level, what can you say about the sample size?

23. An automobile manufacturing company is bringing out a new car model. The company is interested to know whether the model will appeal most to a particular age-group or equally to all age-groups. The company takes a random sample from persons attending a demonstration show of the new model and obtained the following information.

Persons who   Age group

	Under 20	30-39	40-59	60 and above
Liked the car	146	78	41	28
Disliked the car	54	52	32	

What conclusion can be drawn from the above data at 5% level of significance

24. A certain stimulus administered to each of 12 patients resulted in the following increases of blood pressure.

5, 2, 8, -1, 3, 0, 6, -2, 1, 5, 0, 4

Can it be concluded that the stimulus in general will be accompanied by an increase in blood pressure. ($\alpha = 0.05$)

25. Discuss in detail the uses of t distribution in test of significance.

(2×15=30)