

Reg. No.....

Name.....

B. Sc. DEGREE END SEMESTER EXAMINATION – MARCH 2025**SEMESTER 4: STATISTICS FOR PSYCHOLOGY****COURSE: 19U4CPSTP04 – STATISTICAL INFERENCE – PAPER IV***(For Regular - 2023 Admission and Improvement/Supplementary 2022/2021/2020 Admissions)*

Time: Three Hours

Max. Marks: 75

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

1. The probability of rejecting a true null hypothesis is called
2. Standard error is the standard deviation of
3. The probability of rejecting the null hypothesis when it iscalled power.
4. In a test, the value of test statistic was obtained as 2.44 and the critical value for the selected level of significance was 2.33. Then the null hypothesis is
5.distribution is used for testing the equality of two population means using small samples with unknown population standard deviations.
6. The test statistic used for testing the hypothesis concerning equality of variances of two populations follows distribution.
7.test is used for testing whether two characteristics are independent or not.
8. The degrees of freedom for testing the independence of two attributes when the observed frequencies are in a table of 4 rows and 3 columns is
9. For testing the hypothesis concerning variance of a population, a sample of size 17 was taken and its variance was found to be 24. Then the degrees of freedom of the test statistic used is
10. If F follows an F distribution with m, n degrees of freedom, then $\frac{1}{F}$ follows an F distribution withdegrees of freedom.

(1 x 10 = 10)

PART B***Answer any eight of the following questions.******Each question carries 2 marks***

11. Define statistical test.
12. Define composite hypothesis.
13. Define test statistic.
14. Define acceptance region.
15. A publisher claims that the number of printing mistakes in a book published by the company will not be more than 12 per book. Formulate the hypothesis to test the claim of the publisher.

16. The average height of 100 Europeans was found to be 172 Cms with a standard deviation of 6 Cms. Another sample of 120 Asians was found to have a mean height of 168 Cms with a standard deviation of 5 Cms. Formulate the test statistic for testing whether the two populations have the same mean.
17. Briefly explain paired sample t test.
18. Briefly explain the uses of t distribution.
19. Define degrees of freedom.
20. Briefly explain how will you test whether the mean of a population is having a specified value say K given that population standard deviation is σ .

(2 x 8 = 16)

PART C***Answer any five of the following questions******Each question carries five marks***

21. Distinguish between type II error and power of the test.
22. Briefly explain the steps involved in hypothesis testing.
23. Briefly explain how you will test whether two populations have the same variance.
24. The mean mark of 17 students was found to be 820 with a standard deviation of 30. Can it be regarded as a sample from a population having mean mark of 800. (Assume significance level of 5%)
25. A sample of nurses from two hospitals were given a training for improving certain job skills. Their performance was measured after the skill training and the details regarding their score are given below. Test whether the nurses in two hospitals have the same mean. (Significance level 5%)

Hospital	Sample size	Sample Mean	Population variance
A	19	187	40
B	23	190	45

26. In a random sample of 1600 men and 1700 women from a city 1400 and 1440 women are found to be in favour of expansion and widening of a road. Do the data indicate at 5% level of significance that the proportion of men and women differ significantly in their attitude towards expansion and widening of road?
27. The marks of 8 students are recorded below.

112, 111, 101, 88, 93, 95, 117, 100

Test whether the variance in mark of students in the college is 5?

(5 x 5 = 25)

PART D**Answer any two of the following questions****Each question carries 12 marks**

28. Explain the procedure for testing the equality of two population means when
- The sample sizes are large and population variances are not known
 - The Population standard deviations are known
 - The sample sizes are small and population variances are not known
29. The height of 10 teachers and 9 lawyers are given below. Test whether the teachers and lawyers have the same mean height at 1% level of significance

Height in centimeters										
Teachers:	170,	170,	185,	190,	175,	180,	160,	165,	165,	168
Lawyers:	160,	190,	175,	190,	185,	210,	175,	205,	170	

30. A special coaching was given to 10 students for improving the performance in examination. The marks scored in semester examinations before and after the coaching are given below. Test whether the performance improved significantly after the coaching programme. (1%).

Mark scored in Semester examination										
Before Coaching:	46,	57,	49,	64,	50,	56,	42,	54,	60,	50
After Coaching:	49,	63,	45,	72,	54,	60,	48,	54,	56,	51

31. The following table gives the distribution of students in a college according to the place of residence and the courses they have chosen for the Graduate programme. Test whether the place of residence and course selection have any relationship.

Place of residence	Course selected for Graduate programme		
	Commerce	Arts	Science
Rural	220	110	170
Urban	130	90	220
Semi Urban	150	200	210

(12 x 2 = 24)