

B A, BSC, BCOM DEGREE END SEMESTER EXAMINATION – MARCH 2026**UGP (HONS.) SEMESTER - 4: DISCIPLINE SPECIFIC COURSE****COURSE: 24USTADSC201: DATA ANALYSIS IN INFERENCE STATISTICS USING R/PYTHON***(For Regular 2024 Admission)*

Time: 2 Hours

Max. Marks: 70

*(Use of Scientific calculator and statistical tables are permitted)***PART A***(Maximum marks from this part is 10. Each question carries 2 marks)*

1. Define Statistic. Give two examples. (CO1, R)
2. Define point and interval estimation. (CO2, U)
3. Distinguish between one tailed and two tailed tests. (CO4, U)
4. Define Chi-square distribution. (CO2, R)
5. Define Acceptance region and rejection region. (CO5, R)
6. Write down the test statistic and critical region for testing the mean of a normal population (small sample), $H_0: \mu = \mu_0$ when the population variance is unknown. (CO6, R)
7. Distinguish between estimation of parameters and testing of hypothesis. (CO4, U)
8. A sample of 200 students shows 120 passed in Statistics. Find the 95% confidence interval for population proportion. (CO3, A)

PART B*(Maximum marks from this part is 30. Each question carries 5 marks)*

9. Examine whether the sample mean \bar{x} is an unbiased and consistent estimator of λ , when samples are taken from a Poisson population with parameter λ . (CO2, U)
10. Two samples of sizes 8 and 10 have variances 18 and 9 respectively. Test the equality of variances at 5% level. (CO6, A)
11. A study was conducted to determine if there is a relationship between smoking habits and lung cancer. The following data was collected

	Lung cancer	No lung cancer
Smoker	60	40
Non-smoker	30	70

Perform Chi-square test for independence if there is any significant association between smoking habits and lung cancer? (CO6, A)

12. Explain the large sample test of the equality of the means of two populations. (CO5, R)
13. Define confidence interval and derive the confidence interval for population mean when variance is unknown. (CO3, U)
14. In a survey of 500 voters, 260 support a candidate. Test whether the population proportion is 0.5 at 1% level. (CO6, A)
15. Define Sampling distribution. What is the sampling distribution of the mean of the samples from a normal population. (CO2, R)
16. Define (a) Type I error and Type II error (b) Significance level. (CO5, R)

PART C

(Maximum marks from this part is 30. Each question carries 15 marks)

17. Define estimation of parameters. When will you say that an estimate is a good one? (CO2, U)
18. The following are weights (in kg) before and after training for 6 persons:

Person	Before	After
1	70	68
2	75	72
3	80	78
4	65	63
5	72	70
6	68	66

Test whether training reduced weight at 5% level. (CO6, A)

19. Define Chi-square test of independence. Obtain the chi-square test statistic for a 2 x 2 contingency table for testing the independence of two characteristics. (CO6, A)
20. Describe (1) Chi-square distribution (2) t distribution and (3) F distribution. Write applications of these distributions. (CO1, A)