

**BA, BSc, BCOM DEGREE END SEMESTER EXAMINATION - MARCH 2026****UGP (HONS.) SEMESTER - 4: DISCIPLINE SPECIFIC COURSE****COURSE: 24USTADSC202: STATISTICAL TOOLS FOR DECISION MAKING***(For Regular 2024 Admission)*

Time: 2 Hours

Max. Marks: 70

**(Use of Scientific Calculator and Statistical Tables are permitted)****PART A****(Maximum mark from this part is 10. Each question carries 2 marks)**

1. Write the mean and variance of the chi square distribution with  $n$  degrees of freedom. (U, CO 1)
2. What is the Standard error of the mean of a sample of size 25 taken from a normal population with mean 20 and standard deviation 5. (R, CO 1)
3. What is meant by point estimation? (U, CO 2)
4. Define efficiency in point estimation. (R, CO 2)
5. Define alternative hypothesis. (R, CO 3)
6. Define a simple hypothesis.. (R, CO 3)
7. Define power of a test. (R, CO 3)
8. Write the test statistic used for testing the standard deviation of a population. (U, CO 4)

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

9. Find  $k$  if  $P(s^2 \geq k) = 0.05$  where  $s^2$  is the variance of a sample of size 10 taken from a normal population with standard deviation 2. (A, CO 1)
10. Define F distribution and give one statistic following F distribution. (U, CO 2)
11. Show that sample mean is an unbiased estimate of the population mean. (U, CO 2)
12. What do you mean by an estimate? When will you say that an estimate is a good one. (U, CO 2)
13. Explain the two types of errors. (U, CO 3)

14. Explain the procedure for testing equality of two population proportions. (R, CO 4)
15. Explain the concept of p- value in testing of hypotheses. (U, CO 4)
16. A sample of size 900 is found to have a mean of 3.41 gms. Could it be reasonably regarded as a random sample from a large population with mean 3.21 and standard deviation 2.63gms (An, CO 4)

**PART C**

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

17. Apply the mgf method to derive the sampling distribution of means of samples taken from a Normal Population  $N(\mu, \sigma)$ . (A, CO 1)
18. The mean of a sample of size 20 from a normal population  $N(\mu, 8)$  was found to be 81.2. Find a 90% confidence interval for  $\mu$ . (A, CO 2)
19. Two random samples taken from normal populations resulted in the following statistics. Test whether the samples can be regarded as coming from the same normal population (An, CO 4)

size	mean	S.D
16	34	2
25	45	2.5

20. The data given below are the results of iron content of ore using two methods A and B of 7 samples of ores. Use the method of paired comparisons to test whether these two methods yield significantly different percentages of iron at 5% level of significance. (An, CO 4)

Ore no.	1	2	3	4	5	6	7
Method 1	28.22	33.95	28.25	42.52	37.62	37.84	36.12
Method 2	28.27	33.99	38.20	42.42	37.64	37.85	36.21

