

Registration Number:

Date & session:



**ST JOSEPH'S UNIVERSITY, BENGALURU -27**  
**BCA (DATA ANALYTICS) – II SEMESTER**  
**SEMESTER EXAMINATION: APRIL 2024**  
(Examination conducted in May / June 2024)  
**BCADA 2221: ADVANCED STATISTICAL COMPUTING**  
**(For current batch students only)**

**Time: 2 Hours**

**Max Marks: 60**

This paper contains **TWO** printed pages and **THREE** parts

**PART – A**

**Answer ALL the questions**

**5 X 2 = 10**

1. State the difference between an estimator and an estimate.
2. State the properties of t-distribution.
3. Mention the principles of sampling.
4. State any 2 applications of  $\chi^2$  test.
5. Mention the applications of CLT.

**PART – B**

**Answer any Five questions**

**5 X 4 = 20**

6. Explain the types of errors involved in testing of hypotheses with an example.
7. Explain the different types of Sampling Methods.
8. Discuss the various steps involved in testing of hypothesis.
9. Explain the difference between R square and adjusted R square.
10. If  $x_1, x_2, \dots, x_n$  is a random sample from Normal population  $N(\mu, \sigma^2)$ . Find the sampling distribution of sample mean  $\bar{X}$ .
11. A sample of 900 members is found to have a mean of 3.47 cm. Can it be regarded as a simple sample from a large population with mean 3.23 cm and standard deviation 2.31 cm.
12. Explain AR, MA and ARMA models.

**PART - C**

**Answer any Three questions**

**3 X 10 = 30**

13. Using the information given below, fit a linear regression line by considering Y as the dependent variable and X as the independent variable. Compute R square and adjusted R square.

Y	4	7	3	9	17
X	2	3	1	5	9

14. The following table gives the yields of 15 samples of plot under three varieties of seed.

A	20	21	23	16	20
B	18	20	17	15	25
C	25	28	22	28	32

Test using analysis of variance whether there is any significant difference in the average of yield of seeds.

15. A light bulb company claims that the 100-watt light bulb it sells has an average life of 1200 hours with a standard deviation of 100 hours. For testing the claim 50 new bulbs were selected randomly and allowed to burn out. The average lifetime of these bulbs was found to be 1180 hours. Is the company's claim is true at 5% level of significance? (Given  $z_{0.025} = 1.96$ )
16. What are the assumptions of multiple regression model? Explain each one of these assumptions focusing on the problem that may arise if these assumptions are relaxed.