Registration Number:

Date & session:

ST.JOSEPH'S UNIVERSITY, BENGALURU -27
M.Sc. (BIG DATA ANALYTICS) – II SEMESTER
SEMESTER EXAMINATION: APRIL 2023
(Examination conducted in May 2023)

BDA2221 – ADVANCED STATISTICAL METHOD
(For current batch students only)

Time: 2 Hours **Max Marks: 50**

This paper contains ONE printed page and THREE parts

PART-A

Answer ALL the question **2X5=10**

1. Define Unbiasedness and Consistency
2. Distinguish between MVUE and UMVUE
3. What do you mean by Gauss Markov Model?
4. Write down the general form of Logistic regression model.
5. Define seasonal variation and give an example

PART-B

Answer any FIVE questions **4X5=20**

6. Show that sample mean $\bar{X}$ is an unbiased Estimator of Population meanμ of $N(\mu, \sigma^2)$
7. Let X_1, X_2 is a random sample from $B(1, P)$. Let $T_1 = \frac{X_1+X_2}{2}$ and $T_2 = \frac{X_1+3X_2}{4}$ are the two estimators of P. Which one is more efficient estimator?
8. Explain Bootstrap sampling
9. Find the distribution of estimate b_1 of β_1 of the simple linear model $Y = \beta_0 + \beta_1 X + \epsilon$
10. For the data given below Obtain simple linear model

X	1	2	3	4	5
Y	3	5	4	7	6

11. What are the components of time series? Explain with example

PART-C

Answer any TWO questions **10X2=20**

12. a) Explain EM algorithm.
    b) A sample of 5 values is selected from a Normal Population $N(\mu, 1)$. Among them a value is missing. The values are 4, 6, 5, __, 4. Using EM- algorithm find The MLE of μ
13. For the data given below obtain multiple linear models.

X_1	0	1	2	3	4	5	6	4	5	4
X_2	1	2	1	3	1	5	0	2	3	2
Y	2	4	3	5	6	7	7	6	9	6

    Also test whether $\beta_0 = 1.5$, β_1 =0.8 and $\beta_2 = 0.2$.Given ($t_{0.025}(7) = 2.365$
14. With an example explain AR, MA , and ARMA Models