Reg. No. : ....

Name : ....

V Semester B.Sc. Degree (C.B.C.S.S. – O.B.E. – Regular/Supplementary/ Improvement) Examination, November 2023
(2019-2021 Admissions)
CORE COURSE IN STATISTICS
5B07 STA : Regression Techniques and Time Series

Time : 3 Hours

Max. Marks : 48

*Instruction : Calculators and statistical tables are **permitted**.*

PART – A

Answer **all** questions. **Each** carries **1** mark.   **(6×1=6)**

1. Define a linear parametric function.

2. Give applications of Gauss Markov theorem.

3. What is meant by multicollinearity ?

4. What is meant by a systematic component in a regression model ?

5. What is a binary response variable ?

6. Give an example of trend in a time series.

PART – B

Answer **any 7** questions. **Each** carries **2** marks.   **(7×2=14)**

7. Is sample mean a Best Linear Unbiased Estimator for the population mean? Justify.

8. How do you test a linear hypothesis in Gauss Markov setup ?

9. Write down the normal equations in the least square analysis of an exponential curve of the form $y = ae^{bx}$.

10. Given that in a regression analysis, intercept and slope parameters are estimated to be 2.5 and 1.2 respectively. State the physical interpretation of these estimates.

P.T.O.

11. Show that the OLS estimate of regression parameters in a multiple linear regression model is a linear function of observations.

12. What is meant by logit transformation ?

13. Define additive model in time series analysis.

14. What is meant by seasonal variation ?

15. Name the methods of analyzing trend in a time series.

PART – C

Answer **any 4** questions. **Each** carries **4** marks.   **(4×4=16)**

16. What are estimation and error spaces ?

17. Fit an equation of the form $y = ae^{bx}$ for the following data.

X	1	2	3	4	5	6
Y	1.6	4.5	13.8	40.2	125	300

18. Normal error models are not appropriate when the response variable is binary. Give the reasons to justify this.

19. Explain the semiaverage and moving average methods of measuring trends.

20. How do we fit a second-degree curve for a given data ?

21. What do you mean by a best fitted curve ?

PART-D

Answer **any 2** questions. **Each** carries **6** marks.   **(2×6=12)**

22. State and prove a necessary and sufficient condition for the estimability of a linear parametric function.

23. Derive the procedure of hypothesis test of slope and intercept in a simple linear regression model.

24. Describe the analysis of variance procedure for polynomial regression models.

25. Explain ratio to trend method and link relative methods for analyzing seasonal variation.

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