M.Sc. IV SEMESTER [MAIN/ATKT] EXAMINATION MAY - JUNE 2025

STATISTICS

Paper - IV

[Econometrics]

[Max. Marks : 75] *[Time : 3:00 Hrs.]* *[Min. Marks : 26]*

Note : Candidate should write his/her Roll Number at the prescribed space on the question paper.
Student should not write anything on question paper.
Attempt all five questions. Each question carries an internal choice.
Each question carries **15 marks.**

Q. 1 In general linear model show that $\hat{\beta}$ is BLUE.

OR

Explain heteroscedastic disturbances with example. In heteroscedastic model -
i) If the (variance of) disturbance term is proportional to the square of X then calculate var(b_2) and var ($\hat{\beta}$)
ii) If the variance of the disturbance term is proportional to X then calculate var (b_2) and var ($\hat{\beta}$)

Q. 2 Explain auto correlation with example. If the disturbance term follow first order autoregressive model then show that
$$\text{cov} (U_t \ U_{t-s}) = \rho^s \ \sigma_U^2 \ (\text{for } s \neq t)$$
what are the consequences of auto correlated disturbance. Apply their BLUE.

OR

Explain Multicollinearity with example. What are the consequences of Multicollinearity. How you will handled such problems in practice.

Q. 3 For error in variable case the estimators are biased and inconsistent. Apply Wald and Barlett's test for estimating parameter.

OR

What do you understand by Instrumental Variables ? Find out the consequences of the violation of the assumption of no errors of measurement in the independent variable of a simple regression models.

P.T.O.

Q. 4 What is the problem of Identification. Explain rank and order condition in identification problem.

<div align="center">**OR**</div>

Explain least variance ratio with example.

Q. 5 Explain three stage least square (3SLS) method with example.

<div align="center">**OR**</div>

Explain recursive models with example.

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