

THIRD SEMESTER M.A. DEGREE EXAMINATION, NOVEMBER 2025
(Regular/Improvement/Supplementary)

ECONOMICS
FECO3C11 - BASIC ECONOMETRICS

Time: 3 Hours

Maximum Weightage: 30

Part A: Multiple choice questions. Answer *all* questions. Each carries $\frac{1}{5}$ weightage.

1. Maximum likelihood estimation chooses parameter values that:
 - a) Minimize the residuals.
 - b) Maximize the likelihood of observing the given sample data.
 - c) Minimize the variance of estimators.
 - d) Equalize means of variables.

2. In econometrics, the primary role of the stochastic error term is:
 - a) To reduce the sample size.
 - b) To capture the effect of omitted variables.
 - c) To improve correlation.
 - d) To determine causality.

3. The p-value represents:
 - a) The minimum significance level at which the null hypothesis can be rejected.
 - b) The probability of the null hypothesis being true.
 - c) The proportion of explained variance.
 - d) The sum of squared errors.

4. In a three-variable regression model $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + u$, β_1 represents:
 - a) The effect of X_1 on Y holding X_2 constant.
 - b) The total effect of X_1 on Y .
 - c) The correlation between X_1 and Y .
 - d) The covariance between X_1 and Y .

5. The F-test in multiple regression is used to:
 - a) Test the significance of a single coefficient.
 - b) Test the overall significance of the regression model.
 - c) Detect multicollinearity.
 - d) Check normality of residuals.

(P.T.O.)

6. The Chow test is primarily used for:
- a) Testing for heteroscedasticity.
 - b) Testing for structural breaks.
 - c) Testing for autocorrelation.
 - d) Testing for normality.
7. Which of the following is NOT a consequence of multicollinearity?
- a) High R^2 but insignificant t-statistics.
 - b) Difficulty in determining individual variable effects.
 - c) Bias in OLS estimates.
 - d) Large variances of estimators.
8. Heteroscedasticity refers to:
- a) Error terms having unequal variance.
 - b) High correlation among explanatory variables.
 - c) Serial correlation of residuals.
 - d) Perfect multicollinearity.
9. A high Variance Inflation Factor (VIF) indicates:
- a) Low multicollinearity
 - b) No heteroscedasticity
 - c) High multicollinearity
 - d) Autocorrelation
10. In regression through the origin, the intercept term is:
- a) Ignored in hypothesis testing.
 - b) Estimated along with slope.
 - c) Fixed at 0.
 - d) Always equal to 1.
11. ANOVA models are used to analyze:
- a) Dummy variable significance only.
 - b) Time-series stationarity.
 - c) Heteroskedasticity.
 - d) Variance within groups.
12. Seasonal dummy variables are used when:
- a) Intercepts are constrained to zero.
 - b) The model is log-linear.
 - c) The data shows cyclical fluctuations.
 - d) Functional form is reciprocal.
13. A model suffers from specification error if:
- a) It includes irrelevant variables.
 - b) It omits relevant variables.
 - c) It assumes wrong functional form.
 - d) All of the above.
14. A measurement error in the dependent variable usually leads to:
- a) Biased estimates
 - b) Unbiased but inefficient estimates
 - c) Consistent but inefficient estimates
 - d) None of the above
15. Which of the following is true about qualitative response models?
- a) They deal with continuous dependent variables.
 - b) They estimate probabilities of an event occurring.
 - c) They cannot be estimated with MLE.
 - d) They have no application in econometrics.

Part B: Very short answer questions. Answer any *five* questions. Each carries *one* weightage.

16. What are normality assumptions?
17. What does the p-value indicate in hypothesis testing?
18. Write a note on partial regression coefficients.
19. Define multicollinearity.
20. What is the effect of autocorrelation on OLS estimators?
21. Give one example where reciprocal regression can be used.
22. Differentiate between errors of measurement in dependent Vs independent variables.
23. What are the consequences of omitting a relevant variable?

(5 × 1 = 5 weightage)

Part C: Short answer questions. Answer any *seven* questions. Each carries *two* weightage.

24. Outline the assumptions of the classical linear regression model.
25. What do you mean by coefficient of determination? Interpret the meaning of R^2 in regression analysis.
26. Describe the procedure for testing the overall significance of a regression model using the F-test.
27. Explain the use of restricted least squares in testing linear hypotheses.
28. Describe the remedial measures for heteroskedasticity.
29. Explain the concept and applications of piecewise linear regression.
30. Critically evaluate the problem of the dummy variable trap and suggest remedial measures.
31. Differentiate between log-log and log-lin regression models.
32. Write a note on the RESET test with its procedure.
33. Explain different types of specification errors in econometric models.

(7 × 2 = 14 weightage)

Part D: Essay questions. Answer any *two* questions. Each carries *four* weightage.

34. Describe the method of maximum likelihood estimation (MLE) and its application in estimating parameters of a two-variable regression model.
35. Explain the formulation of a three-variable linear regression model. Derive the Ordinary Least Squares (OLS) estimators of the partial regression coefficients.
36. Explain the nature, consequences, detection and remedies for autocorrelation in econometric models.
37. Critically evaluate the Linear Probability Model (LPM) as a qualitative response regression model. Discuss its assumptions, estimation procedure, merits and major limitations.

(2 × 4 = 8 weightage)