

5. Answer **any one** of the following : 14×1=14

(a) What are the issues in specification of econometric model ? Discuss the consequences of omission of an important variable and inclusion of an irrelevant variable in regression model. 4+10=14

(b) Write the advantages and disadvantages of fixed effects model. Explain the random effects technique used for analysing panel data. 6+8=14

(c) What do you mean by an identification problem ? State the necessary and sufficient conditions required for identification.

Examine whether the demand equation of the following macroeconomic model is identified or not. 2+4+8=14

$$Q_d = \beta_1 + \beta_2 P + \beta_3 Y + \beta_4 P_s + U$$

$$Q_s = \alpha_1 + \alpha_2 P + \alpha_3 W + \delta$$

$$Q_d = Q_s$$

where, Q_d - quantity demanded
 Q_s - quantity supplied
 P - price level
 P_s - price of substitute
 Y - income
 W - labour wages

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2024

ECONOMICS

Paper : ECOHE5126

[(Applied Econometrics (Option-I))]

Full Marks : 80

Pass Marks : 32

Time : 3 hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct option of the following : 1×6=6
(any six)

(a) Which of the following methods is used in empirical research ?

(i) Inductive method

(ii) Initiative method

(iii) Scientific method

(iv) Deductive method

- (b) The term research methodology refers to
- (i) the methods used in data collection and analysis
 - (ii) the rules for writing a research report on paper
 - (iii) the specific method for study and analysis
 - (iv) the theoretical paradigms for data collection, analysis and interpretation
- (c) Which of the following tests is used to detect specification errors ?
- (i) Ramsey's RESET test
 - (ii) The Runs test
 - (iii) The Park test
 - (iv) Chow test
- (d) A regression model suffers from the functional form misspecification if
- (i) the dependent variable is binary
 - (ii) an interaction term is omitted
 - (iii) a key variable is binary
 - (iv) the co-efficient of a key variable is zero

- (e) Autoregressive distributed lag models include
- (i) lags of the dependent variable, and lagged values of additional predictor variables
 - (ii) current and lagged values of the error term
 - (iii) current and lagged values of the residuals
 - (iv) lags and leads of the dependent variable
- (f) If OLS is applied separately to each equation that is part of a simultaneous system, the resulting estimates will be
- (i) unbiased and consistent
 - (ii) biased and inconsistent
 - (iii) biased but consistent
 - (iv) it is impossible to apply OLS to equations that are part of a simultaneous system
- (g) Estimation of the instrumental variable regression model
- (i) requires exact identification
 - (ii) allows only one endogenous regressor, which is typically correlated with the error term

(iii) is only possible if the number of instruments is the same as the number of regressors

(iv) requires exact identification or over-identification

(h) The fixed effects regression model

(i) assumes that each unit has a fixed intercept, rather than stochastic conditions

(ii) the slope co-efficients are allowed to differ across entities, but the intercepts fixed

(iii) has fixed the effect of heteroscedasticity

(iv) in a log-log model may include logs of the binary variable which control for the fixed effects.

(i) What is the name of the statistical test that can help us determine whether to choose a fixed effects or random effects model ?

(i) Hausman test

(ii) Z-test

(iii) Chi-squared test

(iv) Link-Wallace test

(j) Panel data is also called

(i) Cross-sectional data

(ii) Longitudinal data

(iii) Time series data

(iv) Experimental data

2. Answer the following questions : **(any five)**
2×5=10

(a) What is empirical research ?

(b) What is a distributed lag model ?

(c) State the differences between endogenous and exogenous variables.

(d) What is an over-identified system of simultaneous equation ?

(e) State two uses of E Views software in research.

(f) Define research hypothesis.

(g) What do you mean by simultaneous equation model in econometrics ?

3. Answer **any six** of the following questions :
5×6=30

- (a) Write the steps involved in conducting empirical research.
- (b) What is specification error ? Mention the reasons of the accuracy of specification error.
- (c) Describe the caution about model selection criteria in economic theory.
- (d) What is panel data ? How does it differ from cross-sectional and time series data ?
- (e) What is autoregressive distributed lag model ? State some features of the autoregressive distributed lag model.
- (f) What is fixed effects model ? Write the differences between fixed and random effects model.
- (g) Differentiate between single equation method and system method. Write the difficulties involved with the system method.
- (h) Discuss the main objectives of model selection in econometrics.

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- (i) Distinguish between distributed lag model, autoregressive model and autoregressive distributed lag model.
- (j) What is reduced form of a simultaneous equation ? Obtain the reduced form of the rational income equation and consumption function from the following Keynesian model of income determination.

$$C_t = \beta_0 + \beta_1 Y_t + u_t$$

$$Y_t = C_t + I_t$$

4. Answer **any two** of the following : 10×2=20

- (a) Define autoregressive model. Discuss the estimation methods of autoregressive models. 2+8=10
- (b) Discuss the various tests applied for identifying the most efficient model in econometrics. 10
- (c) Give two examples of statistical software. Discuss the usefulness of statistical software in research. 2+8=10
- (d) Write an example of panel data. Discuss the advantages and disadvantages of using panel data in research. 2+8=10

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Contd.