

GENERAL ECONOMICS

Paper I

Time Allowed : Three Hours

Maximum Marks : 200

INSTRUCTIONS

Please read each of the following instructions carefully before attempting the questions :

There are FOURTEEN questions divided under THREE sections.

*The ONLY question in Section A is **compulsory**.*

In Section B, SIX out of SEVEN questions are to be attempted.

In Section C, FOUR out of SIX questions are to be attempted.

Candidates should attempt questions/parts as per the instructions given in the Section.

The number of marks carried by a question/part is indicated against it.

All parts and sub-parts of a question are to be attempted together in the answer book.

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly.

Any page or portion of the page left blank in the answer book must be clearly struck off.

Candidates are required to write clear, legible and concise answers and to adhere to word limits wherever indicated. Failure to adhere to word limits may be penalized.

Answers must be written in ENGLISH only.

SECTION A

(Compulsory Section)

Answer *all* of the following six parts in about 100 words each :

5×6=30

1. (a) Define substitution effect. Separate income effect from substitution effect for a fall in the price of a Giffen type good using a suitable diagram. 5
- (b) Show that if the consumer is free from money illusion, the demand function is homogeneous of degree zero. 5
- (c) Give the different views of equity and use utility possibility frontier to show that efficiency does not necessarily imply equity. 5
- (d) State the assumptions of Classical Linear Regression Model. Why are the regressors (X) assumed to be non-stochastic in repeated samples ? 5
- (e) For the Cobb-Douglas production function $Q = A L^\alpha K^\beta$ (where symbols have usual meaning), calculate the input elasticities of output and also derive an expression for the expansion path of the firm. 5
- (f) Define level of significance. How is this level decided for a given problem ? Can we take it as 2% or 6% ? Explain. 5

SECTION B

Answer any **six** out of the following seven questions in about 200 words each : 15×6=90

2. Derive the demand functions from the utility function $U = f(q_1, q_2, \dots, q_n)$ subject to budget constraint $y = p_1q_1 + p_2q_2 + \dots + p_nq_n$ and if the demand function for a commodity i ($i = 1, 2, \dots, n$) is homogeneous of degree zero in prices and income, then show that the sum of own and cross price elasticities of demand for the commodity equals its income elasticity of demand with negative sign. 15
3. Show that, "If the second order condition is satisfied, every point of tangency between an isoquant and an isocost line is the solution of both a constrained maximum and a constrained minimum." 15
4. Distinguish between point estimation and interval estimation of a population parameter. State the small sample properties of a good estimator. 15
5. (a) Derive the long run supply function under perfect competition when there are external economies or external diseconomies. 7
- (b) Consider an industry represented by two competitive firms with the total cost functions as follows :

$$C_1 = a_1q_1^2 + bq_1q$$

$$C_2 = a_2q_2^2 + bq_2q$$

where $q_1 + q_2 = q$ and $a_1 > 0, a_2 > 0$.

Derive the aggregate supply function of the industry when there are (i) external economies ($b < 0$), and (ii) external diseconomies ($b > 0$). 8

6. Consider a duopoly with product differentiation in which the demand and cost functions are

$$q_1 = 88 - 4p_1 + 2p_2$$

$$C_1 = 10q_1$$

and $q_2 = 56 + 2p_1 - 4p_2$

$$C_2 = 8q_2$$

for firms I & II respectively.

Derive the price reaction functions for each firm on the assumption that each maximises its profits with respect to its own price. Determine the equilibrium values of price, quantity and profit for each firm.

15

7. "Pareto optimal allocation is contingent upon the assumption that there are no external effects on consumption and production." Examine what happens if there are external effects.

15

8. What is stationarity in a time series analysis ? Show that a random walk model is non-stationary. Discuss the Dickey-Fuller test for stationarity.

15

SECTION C

Answer any **four** of the following six questions in about
300 words each :

20×4=80

9. (a) Distinguish between a cooperative and a non-cooperative game. 5
- (b) In a non-cooperative game, find
- (i) saddle point in a pure strategy game 5
 - (ii) maximum expected pay-off in a mixed strategy game 5
 - (iii) solution of a sequential game in an 'extensive form' 5
10. (a) Define heteroscedasticity. 5
- (b) Explain :
- (i) Consequences of heteroscedasticity on OLS estimates 5
 - (ii) Detection of heteroscedasticity in a model 5
 - (iii) Estimation procedure in the presence of heteroscedasticity 5
11. Given the Classical Linear Regression model with usual assumptions
- $$Y_i = \beta_0 + \beta_1 X_i + U_i \quad i = 1, 2, \dots, n$$
- (a) Examine the goodness of fit of the model using ANOVA. 10
- (b) If the value of \bar{R}^2 is low, how can it be improved? 10

12. Distinguish between basic feasible solution, feasible solution and optimal solution of a Linear Programming Problem (LPP). Solve the following LPP graphically : 20

$$\text{Maximize } Y = q_1 + 2q_2$$

$$\text{subject to } q_1 + 3q_2 \leq 18$$

$$q_1 + q_2 \leq 8$$

$$2q_1 + q_2 \leq 14$$

$$q_1, q_2 \geq 0$$

13. Examine the situation of market-equilibrium when;
- (a) supply and demand are not equal at a non-negative price-quantity combination. 10
 - (b) supply and demand are equal at more than one non-negative price-quantity combination. 10
14. How is distributional inequality of various kinds measured with the help of income as a resource ? Name some common inequality measures and state their properties. 20