

## **GENERAL ECONOMICS**

### **Paper – I**

*Time Allowed : Three Hours*

*Maximum Marks : 200*

#### **Question Paper Specific Instructions**

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

*There are **THIRTEEN** questions divided under **THREE** sections.*

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

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

*In Section C, **THREE** out of **FIVE** questions are to be attempted.*

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

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

*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 Question-cum-Answer Booklet must be clearly struck off.*

*Candidates are required to write clear, legible and concise answers.*

*Answers must be written in **ENGLISH** only.*

**SECTION A**

**Q1. Answer all the following seven parts.**

**5×7=35**

- (a) Show the conditions for a Cobb-Douglas production function under :
- (i) increasing returns to scale
  - (ii) constant returns to scale
  - (iii) diminishing returns to scale
- Are the Laws of Returns compatible ? 5
- (b) Define homothetic preferences. Explain the common characteristics of such preferences with the help of necessary diagrams. 5
- (c) What is monopoly power ? What factors determine the amount of monopoly power ? 5
- (d) Explain the difference between Bandwagon effect and Snob effect. 5
- (e) What is meant by deadweight loss ? Why does a price ceiling usually result in a deadweight loss ? 5
- (f) State the fundamental theorems of Welfare Economics. 5
- (g) Public goods are both non-rival and non-exclusive. Explain each of these terms and show clearly how they differ from each other. 5

**SECTION B**

**Answer any five of the following seven questions.**

- Q2.** (a) Explain the meaning of Nash equilibrium. How does it differ from an equilibrium in dominant strategies ? 8
- (b) Let market demand faced by the duopolists be
- $$P = 100 - 0.5Q; \quad Q = Q_1 + Q_2$$
- and their respective cost functions as
- $$C_1 = 5Q_1 \text{ and } C_2 = 5Q_2.$$
- Find out Cournot-Nash Equilibrium. 10
- Q3.** (a) Suppose the utility function for the consumer takes one of the following forms :
- (i)  $U = 50x + 20y$
- (ii)  $U = 20x + 50y$
- (iii)  $U = 80x + 40y$
- The budget of the consumer is ₹ 10,000. The prices of good X and good Y are ₹ 50 and ₹ 20 per unit respectively. Determine the possibility of determination of the equilibrium basket in each case using diagram and comment on the nature of the solutions. 12
- (b) Outline how the production possibility frontier can be used to explain the concept of opportunity cost. Why is the production possibility frontier concave to the origin ? 6
- Q4.** Suppose that a firm's production function is given by the Cobb-Douglas function :  $Q = K^\alpha L^\beta$  (where  $\alpha, \beta > 0$ ). The firm can purchase all the K and L it wants in competitive input markets at rental rates of r and w respectively.
- (i) Show that cost minimisation requires  $\frac{rK}{\alpha} = \frac{wL}{\beta}$ . What is the slope of the expansion path for this firm ? 8
- (ii) Assuming cost minimisation, show that total costs can be expressed as a function of Q, r and w of the form
- $$TC = BQ^{\frac{1}{\alpha+\beta}} \cdot w^{\frac{\beta}{\alpha+\beta}} \cdot r^{\frac{\alpha}{\alpha+\beta}},$$
- where B is a constant depending on  $\alpha$  and  $\beta$ . 3
- (iii) Show that if  $\alpha + \beta = 1$ , total cost (TC) is proportional to Q. 3
- (iv) Calculate the firm's marginal cost curve. 4

- Q5.** (a) Distinguish between economic rent and transfer earnings. Can economic rent exist in the long run ? Justify your answer. 9
- (b) Explain graphically the role of elasticity of supply of a factor determining the economic rent. 9

- Q6.** (a) Why do externalities prevent markets from being efficient ? How does Coase theorem correct an externality ? 10
- (b) Using a particular industry, explain what is meant by economies of scale and economies of scope. How do these affect the industry you have identified ? 8

- Q7.** (a) In a contest, two judges ranked eight candidates A, B, C, D, E, F, G and H in order of their preference as shown in the following table. Find the rank correlation coefficient.

|              | A | B | C | D | E | F | G | H |
|--------------|---|---|---|---|---|---|---|---|
| First Judge  | 5 | 2 | 8 | 1 | 4 | 6 | 3 | 7 |
| Second Judge | 4 | 5 | 7 | 3 | 2 | 8 | 1 | 6 |

- (b) The regression equations of the variables x and y are  $8x - 10y + 66 = 0$  and  $40x - 18y = 214$ . The variance of x is 9. Identify the two regression lines. Find the simple correlation coefficient between the two variables and variance of y. 9
- Q8.** Discuss Social Choice theory in Economics. Distinguish between the views of Amartya Sen and Kenneth Arrow in making choices for social welfare. 18

## SECTION C

Answer any *three* out of the following five questions.

Q9. (a) Consider a two-variable linear regression model

$$Y_t = \alpha + \beta X_t + U_t$$

and  $U_t = \rho U_{t-1} + \varepsilon_t; |\rho| < 1$

Find Mean, Variance and Covariance of random disturbance term ( $U_t$ ). 5

(b) Consider the model of wage determination :

$$Y_t = \beta_1 + \beta_2 X_t + \beta_3 Y_{t-1} + U_t$$

where

$$Y = \text{wages}$$

$$X = \text{productivity}$$

$$U_t = \rho U_{t-1} + \varepsilon_t; -1 < \rho < 1$$

Discuss the method of testing with the help of appropriate test statistic. 5

(c) Consider a model

$$Y_t = \beta_1 + \beta_2 X_t + U_t$$

and  $U_t = \rho U_{t-1} + \varepsilon_t$

Discuss the process of the removal of autocorrelation when

(i)  $\rho$  is known

(ii)  $\rho$  is unknown (using Cochrane-Orcutt iterative method) 15

- Q10.** (a) An economy produces only coal and steel. The two commodities serve as intermediate inputs in each other's production. 0.4 tonne of steel and 0.7 tonne of coal are needed to produce a tonne of steel. Similarly, 0.1 tonne of steel and 0.6 tonne of coal are required to produce a tonne of coal. No capital inputs are needed. 2 and 5 labour days are required to produce a tonne of coal and steel respectively. If the economy needs 100 tonnes of coal and 50 tonnes of steel,
- (i) Calculate the gross output of the two commodities and the total labour required. 15
  - (ii) Write down technology matrix.
  - (iii) Do you think that the system is viable ?
  - (iv) Determine the equilibrium prices, if the wage rate is ₹ 10 per man-day. 15
- (b) Mohan is paid ₹ 8 if two coins turn both heads and ₹ 1 if two coins turn both tails. Ram is paid ₹ 3 when the two coins do not match.
- (i) Write down the pay-off matrix of the above problem. 5
  - (ii) Whom do you consider in the better situation ? 5
- Q11.** (a) Compare the distribution theory of Marx with that of Ricardo. 10
- (b) Explain when Kaldor's theory of distribution becomes more appropriate. 10
- (c) Narrate the areas where Kaldor's distribution model fails. 5
- Q12.** (a) The kinked demand curve describes price rigidity. Explain how the model works. Why does price rigidity occur in oligopolistic market ? 15
- (b) State and prove Product Exhaustion Theorem. How does it differ from Clark-Wicksteed-Walras Theorem ? 10
- Q13.** (a) Consider a two variable linear regression model :
- $$Y_i = \alpha + \beta X_i + U_i$$
- and
- $$\text{Var}(U_i) = E(U_i^2) = \sigma_i^2$$
- Show that  $\hat{\beta}$  is unbiased and inefficient estimator of  $\beta$ . 10

(b) Consider a three variable linear regression model

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i$$

and suppose that

(i)  $\sigma_i^2 = \sigma^2 Z_i^2$

(ii)  $\sigma_i^2 = \sigma^2 X_{1i}$

(iii)  $\sigma_i^2 = \sigma^2 X_{1i}^2$

Discuss Generalised Least Squares (GLS) method to overcome the heteroscedasticity problem under three cases (i, ii and iii).

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