A-HDR/HRR-N-HFA

GENERAL ECONOMICS

Paper I

Time Allowed : Three Hours *Maximum Marks : 200*

INSTRUCTIONS

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

There are TWELVE 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, THREE out of FOUR 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 chronological 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

*Answer any **seven** of the following parts. Each answer should be in about 100 words.* 5×7=35

1. (a) Is the following statement *true* or *false* ? Explain.

"If a consumer's utility function is of the form = $x_1^{1/3}\ x_2^{1/3}$, she faces prices p_1 and p_2 and her income is I, then her indirect utility function is $V = I^3 / (3p_1 p_2)$." 5

(b) Define complements and substitutes. In the two-commodity case, can the commodities be complements ? Explain. Is your answer valid in the case of gross substitutes and complements ? Explain. 5

(c) Other things equal, what happens to consumer surplus if the price of a good falls ? Why ? Illustrate using a demand curve. 5

(d) What is meant by "internalizing" an externality ? How can a negative externality be internalized ? 5

(e) What is productivity principle ? How can this be achieved through market mechanism ? 5

(f) What is Nash Equilibrium ? Do all games have Nash Equilibrium ? Can a game have more than one equilibrium ? 5

(g) List out the sources of monopoly power. 5

(h) Explain the concept of co-integration in a time series analysis. 5

SECTION B

*Answer any **six** of the following questions. Each answer should be in about 200 words.* *15×6=90*

2. Hrishita likes sandwiches (S) and coffee (C). Her indifference curves are bowed in toward the origin and do not intersect the axes. The price of a sandwich is ₹ 5 and the price of a cup of coffee is ₹ 3. She is spending all her income at the basket she is currently consuming, and her marginal rate of substitution of sandwiches for coffee is 2.

   Is she at an optimum ? If so, show why. If not, should she buy fewer sandwiches and more coffee, or the reverse ? Argue in favour of your opinion. *15*

3. The demand for good X is estimated to be $Q = 250{,}000 - 500P - 1{\cdot}5M - 240P_R$, where M is the (average) consumer income and P_R is the price of a related good Y. The values of P, M and P_R are expected to be ₹ 200, ₹ 60,000 and ₹ 100 respectively.

   (a) Calculate the price elasticity of demand, income elasticity of demand and cross price elasticity.

(b) Is the demand for X elastic, inelastic or unit-elastic ? How would a small increase in P affect total revenue ?

(c) Is the good X normal or inferior ? Are the goods X and Y substitutes or complements ? *15*

4. Assume that a monopolist sells a product with the cost function $C = F + 20Q$, where C is total cost, F is a fixed cost, and Q is the level of output. The inverse demand function is $P = 60 - Q$, where P is the price in the market. (i) How much profit does the firm earn when it charges the price that maximizes profit ? (ii) At what price will the firm earn zero economic profits ? *15*

5. Distinguish between Differentiation and Integration. Explain their application in economics with suitable examples. *15*

6. There are only two firms in an industry, firm 1 and firm 2. The market demand curve is given by the equation $P = 12 - (q_1 + q_2)$ are the (total) cost functions facing the firms are $C_i = 4q_i$, where $i = 1, 2$. If firm 1 acts as a leader and firm 2 as a follower, what are the quantities that the two firms will produce in the equilibrium ? What profits will they earn ? *15*

7. Consider a manufactured good whose production process generates pollution. The annual demand for the good is given by $Q^d = 100 - 3P$. The annual market supply is given by $Q^s = P$. In both equations, P is the price in rupees per unit. For every unit of output produced, the industry emits one unit of pollution. The marginal damage from each unit of pollution is given by $2Q$.

(a) Find the equilibrium price and quantity in a market with no government intervention.

(b) Find the socially optimal quantity of the good. What is the socially optimal market price ? *15*

8. What is autocorrelation ? How can we detect it ? How can it be removed from a single equation model ? *15*

SECTION C

*Answer any **three** of the following questions. Each answer should be in about 300 words.* *25×3=75*

9. Consider the production function $Q = (K^{0.5} + L^{0.5})^2$.

(a) What is the name of this type of production function ?

(b) What is the elasticity of substitution for this production function ?

(c) Does this production function exhibit increasing, decreasing, or constant returns to scale ?

(d) Suppose that the production function took the form $Q = (100 + K^{0.5} + L^{0.5})^2$. Does this production function exhibit increasing, decreasing or constant returns to scale ? *25*

10. Consider a two-person, two-commodity, pure-exchange, competitive economy. The consumers' utility functions are $U_1 = q_{11}q_{12} + 12q_{11} + 3q_{12}$ and $U_2 = q_{21}q_{22} + 8q_{21} + 9q_{22}$ respectively (where q_{ij} denotes the consumption of commodity Q_j by consumer i, with $i = 1, 2$ and $j = 1, 2$). Consumer 1 has initial endowments of 8 and 30 units of Q_1 and Q_2 respectively; consumer 2 has 10 units of each commodity.

Determine the excess demand function for the two consumers. Determine an equilibrium price ratio for this economy. *25*

What is the problem of multicollinearity in a regression model ? What is its plausibility ? Explain Farrar – Glauber method to detect it. How can it be removed ? *25*

12. What is optimization problem in economics ? How does linear programming technique help in assigning optimal solution in given resource use ? Explain. *25*