

GENERAL ECONOMICS - I

Time Allowed : Three Hours

Maximum Marks : 200

INSTRUCTIONS

The question paper consists of three Sections. Candidates should attempt NINE parts of the question in Section I, SEVEN questions from Section II and TWO questions from Section III. Candidates should attempt questions as per the instructions given in each Section.

The number of marks carried by each question is indicated in each Section.

Answers must be written only in ENGLISH.

Any assumptions made for answering a question must be mentioned clearly.

Two graph sheets are attached to this question paper for solving graph-related questions. These graph sheets are to be detached carefully from the question-paper and attached securely to the answer book by the candidate.

SECTION I

1. Answer any *nine* of the following parts. Each answer should be in about 50 words.

5×9=45

- (a) Define the compensated demand curve. How does it differ from the uncompensated demand curve ?

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- (b) What do you mean by corner solution? In the case of perfect complementary goods, where do you get the corner solution?
- (c) Given that the average revenue curve is a rectangular hyperbola, what will be the shape of the marginal revenue curve? Comment briefly.
- (d) Suppose that a monopolist faces a demand curve with price elasticity less than one. Should the monopolist adopt the policy of price-increase in order to increase revenue? Justify your answer.
- (e) Define cross elasticity of demand. Based on such definition, how can you distinguish between the substitute goods and the complementary goods?
- (f) Using graphical approach, solve the following linear programming problem :

$$\text{Minimize : } C = 80X + 60Y$$

$$\text{Subject to : } 2X + 2Y \geq 3$$

$$2X + 0Y \geq 1$$

$$X, Y \geq 0$$

- (g) Consider a Cobb-Douglas production function $Y = AK^\alpha L^\beta$ where K and L are respectively the capital and labour to produce output Y . Show that if all the factors are paid according to their marginal products, the total product will be exhausted if $\alpha + \beta = 1$.
- (h) Consider a linear demand function $q = a - bp$, where q = quantity demanded, p = price per unit and $a, b > 0$. Find out the average and the marginal revenue and draw the diagram.

- (i) Establish mathematically the relationship between average cost (AC) and marginal cost (MC):
- (j) Define and distinguish between the normal profit and the super-normal profit under perfect competition. In the short run, find out graphically the amount of profit corresponding to the equilibrium without using the average cost curve.
- (k) In game theory, comment on the terms 'maxi-min' and 'mini-max'.

SECTION II

Answer any *seven* of the following questions. Each answer should be in about 150 words. $15 \times 7 = 105$

2. Define income effect, substitution effect and price effect of any change in price. Show that the price effect can be decomposed into the income effect and the substitution effect. $(2+2+2)+9=15$
3. The demand function $Q_1 = 50 - P_1$ intersects another linear demand function Q_2 at $P = 10$. The elasticity of demand for Q_2 is six times larger than that of Q_1 at that point. Find the demand function for Q_2 . 15
4. Consider the utility function $u = \sqrt{q_1 q_2}$ where q_1 and q_2 are the quantities of two commodities on which the consumer spends his monthly income ₹ 5,000. If the price per unit of q_1 and q_2 be ₹ 50 and ₹ 20 respectively, find out the optimal quantities of q_1 and q_2 . 15
5. Define linear homogeneous production function with the help of CES production function. Also establish that CES production function is strictly quasi-concave for positive L and K, where L, K are labour and capital respectively. $5+10=15$
6. What do you mean by price discrimination? Under which condition is the price discrimination profitable? Trace out the equilibrium situation under price discrimination. $4+4+7=15$

7. How can you get the wage offer curve and the supply curve of labour? How can you justify the backward bending supply curve of labour? 8+7=15
8. What is meant by excess capacity? Why is it bad? Are there any benefits of excess capacity associated with monopolistic competition? 3+3+9=15
9. If $D = 250 - 50p$ and $S = 25p + 25$ are the demand and supply functions respectively, calculate the equilibrium price and the quantity. Hence calculate both consumer's and producer's surpluses under equilibrium. 5+5+5=15
10. Define and distinguish between rent and quasi-rent. What do you mean by transfer earnings? Elucidate the statement that no economic rent is earned when the supply of a factor is perfectly elastic. 4+4+7=15

SECTION III

Answer any *two* of the following questions. Each answer should be in about 300 words. 25×2=50

11. How does Lorenz curve explain income inequality? Explain with one suitable example. Define Gini coefficient with the help of Lorenz curve and show that

$$\text{Gini} = [1 - 2 \times (\text{Area below Lorenz curve})]. \quad 5+5+15=25$$

12. (a) In computing the correlation coefficient between two variables X and Y from 25 pairs of observations, the intermediate results are

$$n = 25, \quad \sum_i X_i = 125, \quad \sum_i X_i^2 = 650, \quad \sum_i Y_i = 100,$$

$$\sum_i Y_i^2 = 460, \quad \sum_i X_i Y_i = 508.$$

Later on at the time of checking it was found that two pairs of observations which should be

X	8	12
Y	6	8

had been incorrectly recorded as

X	6	14
Y	8	6

Calculate the correct value of the

correlation coefficient.

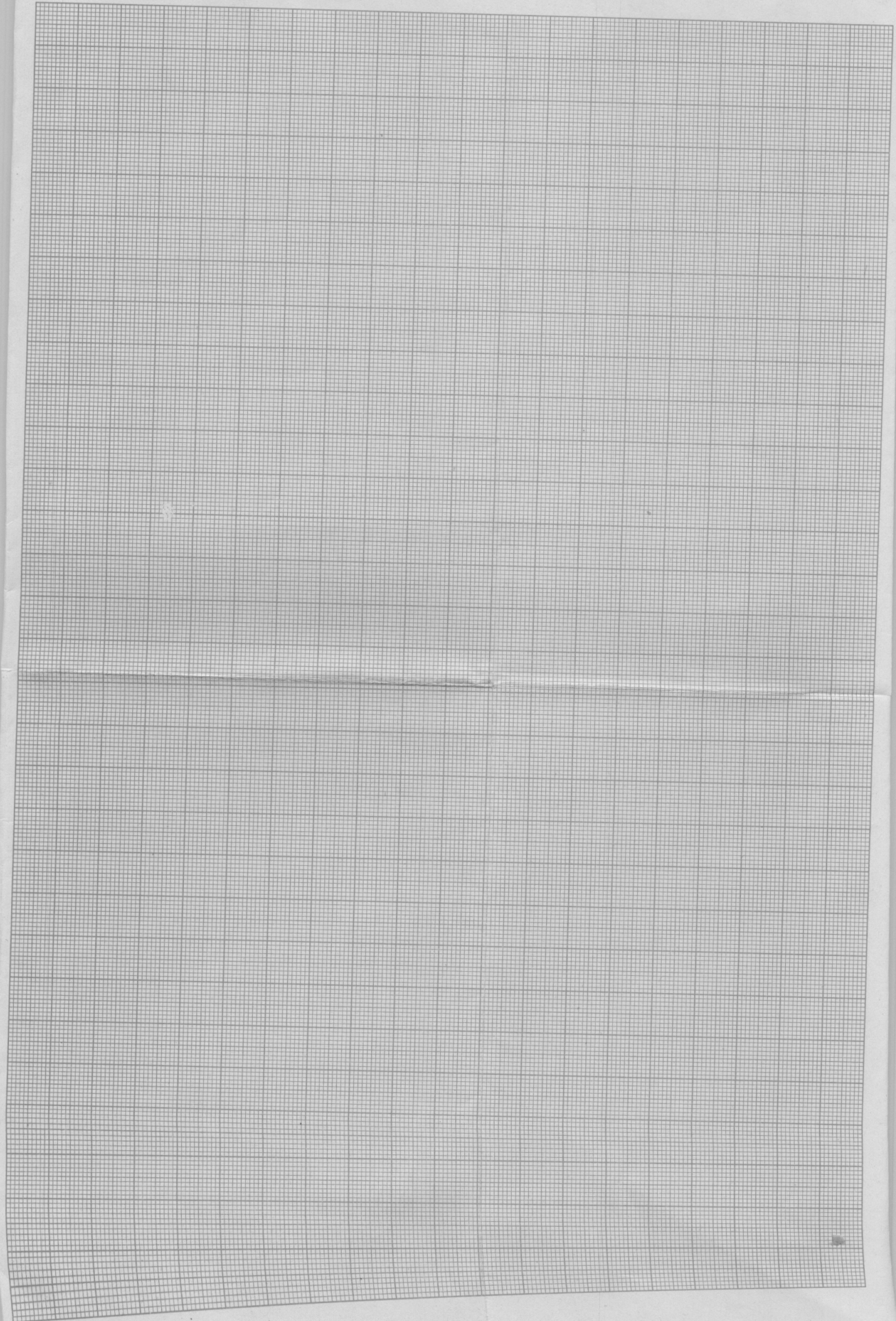
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- (b) Find out the variance of the numbers 1, 2, 3, ..., 50 and the coefficient of variation. What is the advantage of computing the coefficient of variation over the variance? 5+3+2=10

13. (a) Explain the terms as follows and their importance in the context of inference analysis :
Degrees of freedom, Level of significance, and
Power of the test. $4 \times 3 = 12$
- (b) Briefly discuss the principal component analysis
and the rationale for its use. $10 + 3 = 13$

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