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UPSC IES-ISS

**Previous Year Paper
(General Economics-I)
2021**



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) The demand and supply functions are $P_d = (6 - x)^2$ and $P_s = 14 + x$ respectively. Find the consumer surplus under pure competitive market. 5
- (b) Distinguish between Economies and Diseconomies of scope. How can the degree of Economies of scope be determined? 5
- (c) How is the inter-temporal pricing a form of price discrimination? Give example. 5
- (d) For a monopsonist, what is the relationship between the supply of an input and the marginal expenditure on it? 5
- (e) Explain divergence between private and social costs and mislocation of resources in a perfectly competitive system. 5
- (f) Describe the methods used in isolating secular trend in a time series. 5
- (g) Distinguish between pure strategies and mixed strategies of a game. 5

SECTION B

Answer any five of the following seven questions.

18×5=90

- Q2.** (a) Derive Slutsky equation and interpret it. 5
- (b) Given the utility function as
 $12y = 36 - x^2$
 and budget line as
 $M = 12x + 24y$.
 Determine the utility maximizing basket of the two goods. 8
- (c) Find the value of a game : 5

		Firm B	
		B ₁	B ₂
Firm A	A ₁	25	10
	A ₂	5	15

- Q3.** (a) Define cost-output elasticity. Show how it can be used to explain existence or absence of economies of scale in production. 10
 Verify your answer on the following :
- (i) AC = 20 and MC = 10
 (ii) AC = MC = 15
 (iii) AC = 20 and MC = 30
- (b) Given total cost (TC) = $a + bQ + cQ^2$.
 Show that $MC = AC = b + 2\sqrt{ac}$ at $Q = \sqrt{a/c}$
 where AC is minimum. 8
- Q4.** (a) What do the Cournot and Bertrand models have in common ? What are the differences between these two models ? 10
- (b) Why is it possible for a monopolist to earn supernormal profit in the long-run ? 8
- Q5.** (a) State and explain the modern theory of rent. Show how it can be applied to other factors of production. 10
- (b) Explain in terms of the marginal productivity theory how a 'monopolist-monopsonist' firm exploits the society. 8
- Q6.** (a) Distinguish between Egalitarian society, Utilitarian society, Market-oriented society and Rawlsian society. 8
- (b) Using Bergson's welfare contours and grand utility possibility frontier, determine the optimal point of social welfare. 10

Q7. (a) Consider two variable linear regression model :

$$Y = \alpha + \beta x + u$$

The following results are given below :

$$\sum X_i = 228, \sum Y_i = 3121, \sum X_i Y_i = 38297, \sum X_i^2 = 3204 \text{ and}$$

$$\sum x_i y_i = 3347.60, \sum x_i^2 = 604.80 \text{ and } \sum y_i^2 = 19837 \text{ and } n = 20$$

Using this data, estimate α and β and the variances of your estimates. 10

(b) The results of the estimated multiple regression model are given below :

$$\text{TFR} = 4.180 - 0.031 \text{ FLIT} + 0.013 \text{ POV} - 0.009 \text{ URBAN}$$

$$(0.619) \quad (0.0009) \quad (0.0008) \quad (0.011)$$

$$R^2 = 0.637, F = 9.36, n = \text{sample size} = 20$$

Figures in the brackets show standard error.

where TFR = Total Fertility Rate

FLIT = Female Literacy Rate

URBAN = Rate of Urbanization

- (i) Interpret the above results.
- (ii) Do you suspect presence of multicollinearity in the above regression? How do you know?
- (iii) Would you like to drop any of the explanatory variables from the above regression? If yes, which variable and why? 8

Q8. (a) Given the technology matrix

$$A = \begin{bmatrix} 0.1 & 0.3 & 0.1 \\ 0 & 0.2 & 0.2 \\ 0 & 0 & 0.3 \end{bmatrix}$$

and final demands are F_1, F_2 and F_3 .

Find the output levels if $F_1 = 20, F_2 = 0$ and $F_3 = 100$. 8

(b) Fit a second degree polynomial to the following data : 10

Year :	1882	1883	1884	1885	1886	1887	1888	1889	1890
Price Index :	84	82	76	72	69	68	70	72	73

SECTION C

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

25×3=75

Q9. (a) Given the production function as :

$$Q = A L^{\alpha} K^{\beta} ; \alpha > 0, \beta > 0, A > 0$$

Find the shape of isoquant from the above function.

5

(b) Define Elasticity of Substitution of factors. What will be the shape of the isoquant when elasticity of substitution is zero and infinity ?

10

(c) Write down the Constant Elasticity of Substitution (CES) production function and show that Cobb-Douglas (CD) production function is a special case of CES function.

10

Q10. Given the production and cost functions as :

$$Q = 500 L^{1/4} K^{3/4}$$

$$C = wL + rK$$

(a) Derive the demand curve for labour and capital with a view to maximizing the output when the cost is limited to ₹ 10,000. Would your answer change if the objective shifts to cost minimization with a desired level of output ? Give reasons in support of your answer.

15

(b) Determine the equilibrium levels of employment of the factors in each case given :

$$w = 10 \text{ and } r = 75$$

10

Q11. (a) Discuss the notion that the 'bargaining solution' to environmental problems results in the same outcome whether the polluter compensates the sufferers or the sufferers pay the polluter to reduce their levels of emissions.

15

(b) Why is there a social cost to monopsony power ? If the gains to buyer from monopsony power could be redistributed to sellers, would the social cost of monopsony power be eliminated ? Explain.

10

- Q12.** A local business firm is planning to advertise a special sale on radio and television. Its weekly advertising budget is ₹ 16,000. A radio commercial costs ₹ 800 per 30-second slot while a television commercial costs ₹ 4,000 per 30-second slot. Radio slots cannot be bought less than 5 in number while TV slots available are at the most 4 per week. Given that a TV slot is 6 times as effective as a radio slot in reaching consumers, how should the firm allocate its advertising budget to attract the largest number of them ? How will the optimal solution be affected if the availability of the television slots is no longer constrained ?
- (i) Formulate LPP model. 10
- (ii) Solve the above using graphical method. 15
- Q13.** (a) (i) Explain the concept of direct regression and reverse regression in presence of two variables X and Y. 5
- (ii) Suppose a two variable linear regression model without intercept term. Estimate the slope parameter of such a model and show that it is an unbiased estimator. 10
- (iii) Find the value of r^2 when the intercept term is absent in the two variable linear regression model. 5
- (b) Consider Cobb-Douglas production function :
- $$Q = b_0 L^{b_1} K^{b_2}$$
- Test the hypothesis at 5% level of significance
- $$H_0 : b_1 + b_2 = 1$$
- against $H_1 : b_1 + b_2 \neq 1$. 5