

2020/TDC (CBCS)/ODD/SEM/
ECOHCC-101T/451

TDC (CBCS) Odd Semester Exam., 2020
held in March, 2021

ECONOMICS

(1st Semester)

Course No. : ECOHCC-101T

(**Introductory Microeconomics**)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks
for the questions

SECTION—A

1. Answer any ten of the following questions :

2×10=20

- Mention two factors that cause scarcity.
- Define economic efficiency.
- What is economic system?
- State two uses of graphs in economic analysis.

(2)

- (e) Point out two factors that shift the demand curve to the left.
- (f) Distinguish between individual demand and market demand.
- (g) Mention two assumptions of law of supply.
- (h) What is producer's surplus?
- (i) Distinguish between cardinal utility and ordinal utility.
- (j) State the two conditions of consumer's equilibrium in case of a single commodity.
- (k) Mention two assumptions of substitution effect.
- (l) Why does an indifference curve slope downward from left to right?
- (m) Distinguish between short-run period and long-run period.
- (n) What are the two conditions of equilibrium under perfect competition?
- (o) Why is the monopoly firm called a price-maker?
- (p) Why are average revenue (AR) and marginal revenue (MR) equal under perfect competition?

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(Continues)

(3)

- (q) What is derived demand?
- (r) Mention two factors that cause shift in input demand curves.
- (s) Distinguish between marginal product of labour (MP_L) and marginal revenue product of labour (MRP_L).
- (t) Why is price for land market demand determined?

SECTION—B

Answer *any five* questions

2. Define economics. Discuss in brief the scope and method of economics. $2+8=10$
3. Explain the central problems of an economy. Why do they arise? $7+3=10$
4. Distinguish between movement along same demand curve and shift in demand curve. Show graphically how market demand can be derived from individual demand curve. $3+7=10$
- What does consumer surplus measure? How is it calculated? Discuss briefly the importance and limitations of consumer's surplus. $2+2+3+3=10$
- Define indifference curve. Explain the properties of indifference curve. $2+8=10$

7. Write short notes on the following : 5+5=
- (a) Derivation of demand curve from indifference curves
 - (b) Relationship between price effect, income effect and substitution effect
8. Distinguish between fixed cost and variable cost. Discuss in brief the derivation of long-run average cost curve (LAC) and long-run marginal cost curve (LMC). 2+8=
9. State three features of perfectly competitive market. Discuss the concept of excess capacity under monopolistic competition with diagram. 3+7=
10. What is input demand curve? Explain how changes in input market affect firm's cost of production. 3+7=
11. Describe how individuals make their labour supply decisions and how this can lead to a backward bending labour supply curve. 4+6=

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ECONOMICS

(1st Semester)

Course No. : ECOHC-102T



(**Mathematical Methods in Economics—I**)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

SECTION—A

1. Answer any ten of the following questions :

2×10=20

- Define continuity of a function.
- Mention the truth table for $p \wedge q$.
- Express $0.111 \dots$ in the form of fraction.
- If $A = \{-1, 1\}$, then find $A \times A$.

(e) Define polynomial function with example.

(f) Write the first four terms of the sequence

$$a_n = n \frac{n^2 + 5}{4}$$

(g) What is the difference between a series and a sequence?

(h) Draw the graph of the function $y = 2x^2$ for the range $-2 < x < 2$.

(i) Find the first four derivatives for the function $y = 9x^3 - 9$.

(j) Obtain the differential dy when

$$y = 2x^2 + 3x + 5$$

(k) Given the total cost function

$$C = 15q - 6q^2 + q^3$$

derive the equation of MC curves.

(l) Write single-variable optimization conditions for $y = f(x)$.

(m) Why are convex functions important?

(n) Mention any two properties of a convex function.

(o) What is the local optimal solution?

(p) Find the value of x at which the function

$$f(x) = (x - 4)^2$$

reaches an extremum. Describe the nature of this extremum.

(q) Define indefinite integrals.

(r) Mention any two rules of operation for definite integral.

(s) Evaluate :

$$\int ae^{4x} dx$$

(t) Given the marginal propensity to consume

$$C'(y) = 0.7 + 0.1y^2$$

find the consumption function $C(y)$.

SECTION—B

Answer any five questions

(a) If $A = \{7, 8, 9\}$, $B = \{0, 1, 8, 9\}$ and $C = \{4, 3, 7, 9\}$, then find—

(i) $A \times (B \cap C)$;

(ii) $(A \times B) \cap (A \times C)$;

(iii) $A \times (B \cup C)$;

(iv) $(A \times B) \cup (A \times C)$;

(v) $(A \cup B) - C$;

(vi) $(A \cup B) - C'$.

- (b) A market research group conducted a survey of 1000 consumers and reported that 720 consumers like product A and 450 consumers like product B. What is the least number that must have liked both products?

3. (a) Evaluate :

$$(i) \lim_{x \rightarrow 0} \frac{\sqrt{4+x} - 2}{x}$$

$$(ii) \lim_{x \rightarrow \infty} \frac{5+6x}{x^2}$$

- (b) Prove that the following function is continuous at $x = 4$:

$$f(x) = 6 + 5x + 4x^2 + 3x^3$$

4. (a) Solve :

$$\log(x) + \log(x+3) = \log(20 - 5x)$$

- (b) Show that $f(x) = 3x + 2$ and $g(x) = \frac{x-2}{3}$ are inverses of each other.

5. (a) Find the sum of the sequence

$$7, 77, 777, 7777, \dots \text{ to } n \text{ terms}$$

- (b) Does the series $\sum_{n=1}^{\infty} \frac{n^3}{n^5 + 3}$ converge? Explain.

(5)

6. (a) Find $\frac{dy}{dx}$, when—

(i) $y = e^x x^n$;

(ii) $y = \log(ax^2 + bx + c)$.

3+3=6

(b) The demand function is given by

$$q = 7 - 2p$$

Calculate e_d , when $p = 1$ and $p = 2$.

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(a) Obtain the extrema for the function

$$C = q^3 + 2q^2 - 4q + 4$$

5

(b) The total cost (C) and total revenue (R) functions of a firm are given by

$$C = 5q^2 + 10 \text{ and } R = -2q^2 + 6q$$

5

Find the output level (q) at which profit of the firm is maximum.

(a) Discuss the geometric properties of a linear function.

4

(b) Given the price equation, $P = 100 - 2Q$, where Q is quantity demanded. Find—

(i) the marginal revenue (MR);

(ii) the price elasticity of demand, when $Q = 10$;

(iii) the nature of the commodity.

6

9. (a) Explain local and global maxima with suitable graphical representation.

(b) Prove that a cubic function must have a point of inflexion.

10. Find the integral of the following : $3+3+4=$

(i) $\int (x+a)^3 dx$

(ii) $\int \frac{(a^x + b^x)^2}{a^x \cdot b^x} dx$

(iii) $\int_0^1 x(1-x)^n dx$

11. (a) The supply function of a firm is given by

$$p = q^2 + 2q + 1$$

Given that the equilibrium is reached at $q = 3$. Find producer surplus at the equilibrium quantity.

(b) Obtain the solution of the equation

$$y_{t+1} - 2y_t = 4$$

Given that $y_t = 4$, when $t = 0$.
