2020

ECONOMICS (Honours)

Paper : III - A & B

(Mathematical Economics)

[New Syllabus]

Important Instructions for Multiple Choice Question (MCQ)

- Write Subject Name and Code, Registration number, Session and Roll number in the space provided on the Answer Script.

  Example : Such as for Paper III-A (MCQ) and III-B (Descriptive).

  Subject Code : | III | A | & | B |

  Subject Name : [ ]

- Candidates are required to attempt all questions (MCQ). Below each question, four alternatives are given [i.e. (A), (B), (C), (D)]. Only one of these alternatives is 'CORRECT' answer. The candidate has to write the Correct Alternative [i.e. (A)/(B)/(C)/(D)] against each Question No. in the Answer Script.

  Example — If alternative A of 1 is correct, then write :
  1. — A

- There is no negative marking for wrong answer.

মাল্টিপল চয়েস প্রশ্নের (MCQ) জন্য জরুরী নির্দেশাবলী

- উত্তরপত্রে নির্দেশিত স্থানে বিষয়ের (Subject) নাম এবং কোড, রেজিস্ট্রেশন নম্বর, সেশন এবং রোল নম্বর লিখতে হবে।

  উদাহরণ — যেমন Paper III-A (MCQ) এবং III-B (Descriptive)।

  Subject Code : | III | A | & | B |

  Subject Name : [ ]

- পরীক্ষার্থীদের সবগুলি প্রশ্নের (MCQ) উত্তর দিতে হবে। প্রতিটি প্রশ্নে চারটি করে সম্ভাব্য উত্তর, যথাক্রমে (A), (B), (C) এবং (D) করে দেওয়া আছে। পরীক্ষার্থীকে তার উত্তরের স্বপক্ষে (A) / (B) / (C) / (D) সঠিক বিকল্পটিকে প্রশ্ন নম্বর উল্লেখসহ উত্তরপত্রে লিখতে হবে।

  উদাহরণ — যদি **1** নম্বর প্রশ্নের সঠিক উত্তর **A** হয় তবে লিখতে হবে :

  1. — A

- ভুল উত্তরের জন্য কোন নেগেটিভ মার্কিং নেই।

Paper Code : III - A

Full Marks : 20 Time : Thirty Minutes

Choose the correct answer.

Each question carries 2 marks.

1. The production function is $Q = 36KL - 2K^2 - 3L^2$. What is the value of Marginal Physical Product of labour at $K = 2$ units and $L = 10$ units?

   (A) 12

   (B) 36

   (C) 10

   (D) 2

2. Let the equation of an Indifference Curve be $U = f\ (x_1, x_2)$. The slope of the indifference curve will be —

   (A) $-(f_1 / f_2)$

   (B) $f_1.f_2$

   (C) $-(f_2 / f_1)$

   (D) None of the above

3. If the cost function is $C = q^3 - 3q^2 + 50q + 10$; what is the value of MC at $q = 2$?

   (A) 50

   (B) 10

   (C) 3

   (D) 20

4. In a fair game which of the following condition holds good ?

(A) Maximin > Minimax

(B) Minimax > Maximin

(C) Minimax = Maximin = 1

(D) Minimax = Maximin = 0

5. A discriminating monopolist practices price discrimination in two markets A & B with elasticities $E_A = 1.2$ and $E_B = 1.5$. What will be P_A / P_B = ?

(A) 1 : 2

(B) 2 : 1

(C) 2 : 5

(D) 5 : 2

6. Find the saving function if $MPC = 0.75$; $C = 40$ —

(A) $40 - 0.25y$

(B) $-40 - 0.25y$

(C) $-40 + 0.25y$

(D) $40 + 0.25y$

7. Consider the game and find the value of the game —

	B_1	B_2	B_3	B_4
A_1	3	–1	4	2
A_2	–1	–3	–7	0
A_3	4	–6	2	–9

(A) – 1

(B) 2

(C) 3

(D) 4

8. The Marginal Cost cannot be written as —

(A) dTC/dQ

(B) $dTVC/dQ$

(C) $dTFC/dQ$

(D) None of the above

9. In LPP the dual of the dual is —

(A) Dual

(B) Primal

(C) Does not exist

(D) None of the above

10. In Open Input Output Model, the demand is —

(A) only exogenous

(B) only endogenous

(C) both exogenous and endogenous

(D) neither endogenous nor exogenous

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2020

ECONOMICS (Honours)

Paper : III - B

(Mathematical Economics)

[New Syllabus]

Full Marks : 80 Time : Three Hours Thirty Minutes

The figures in the margin indicate full marks.

Group - A

[Short Answer Type Question]

Answer any *four* questions.

Section - I

1. Prove that diminishing Marginal Utility is neither necessary nor sufficient to ensure convexity of indifference curve. 10

2. Consider the production function $Q = AK^{\alpha}L^{\beta}$?

   (a) Verify Euler's theorem for this function. 5

   (b) Show that the elasticity of substitution between Labour (L) and Capital (K) is unity. 5

3. Given that dP/dt = 2 (D-S), examine the stability of the following market

   (a) $D = 2 - 2P$

   (b) $S = -4 + 4P$ 10

4. The production function is given as $Q = 7K^{0.3}L^{0.7}$. If the unit prices of K and L are given as 3 and 7 and the firm is ready to spend Rs.100, find the maximum level of output. 10

5. Distinguish between

(a) Two person zero sum game; 5

(b) Two person constant sum game. 5

6. With a fixed outlay a producer can employ 40 units of labour along with 20 units of capital or it can choose to employ 30 units of labour along with 40 units of capital.

(i) Find the equation and slope of the isocost line. 5

(ii) Find the values of corner solution in case labour and capital are found to be perfect substitutes. 5

7. (a) What is a saddle point in a two person zero sum game? What are its properties? 5

(b) Find the maximin and minimax of the following pay-off matrix : 5

$$\begin{bmatrix} -2 & 0 & 3 \\ -1 & -2 & 3 \\ 3 & 0 & -1 \end{bmatrix}$$

Does saddle point exist here?

8. If the demand and supply functions respectively are

$$P = 20 - 5x$$

$$P = 4 + 3x$$

Find the consumer's surplus and producer's surplus if the output and prices are determined in a perfectly competitive market. 5+5

Group - B

[Essay Type Questions]

Answer any *two* questions.

9. Consider a Simple National Income Model as :

$Y_t = C_t + I_t + G_t$

$C_t = \alpha\, Y_{t-1}; 0 < \alpha < 1$

$I_t = \beta\left(C_t - C_{t-1}\right); \beta > 0$

$G_t = 1$

(i) Formulate a second order difference equation.

(ii) Find intertemporal value of income.

(iii) Deduce time path of income.

(iv) Identify the zones where the income displays oscillatory and non-oscillatory movements.

(v) Identify the zones where it displays damped and explosive oscillations.

3+2+3+6+6=20

10. (i) Prove that the elasticity of substitution (σ) of the CES production function is constant.

(ii) If the marginal revenue function is $P_m = \{ab/(x + b)^2 - C\}$, show that $P = \{a / x + b - C\}$ is the demand law. 10+10

11. (i) State the Hawkins Simon condition for viability of a 2 sector Leontief Static Open Model. What is the meaning of the condition in simple economic terms.

(ii) Give a geometrical interpretation of the condition.

(iii) Check the Hawkins Simon condition of the following input coefficient matrix :

$$\begin{vmatrix} 0.4 & 0.2 & 0.3 \\ 0.3 & 0.4 & 0.1 \\ 0.2 & 0.2 & 0.4 \end{vmatrix}$$

8+6+6=20

12. (i) Solve the LPP using graphical method :

Minimize $Z = 4x_1 + x_2$

Subject to $x_1 + x_2 \leq 3$

$4x_1 + 3x_2 = 6$

$3x_1 + x_2 \geq 3$

$x_1, x_2 \geq 0$

(ii) Consider a three sector economy

$C = 5 + 0.25\ (Y\text{-}T)$

$I = 85,\ T = 10,\ G = 15$

(i) Find the equilibrium level of national income.

(ii) Calculate the change in equilibrium level of income if Govt. expenditure is increased by 10 unit.

(iii) Find the value of tax multiplier. 10+(3+3+4)=20

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