

2017

## ECONOMICS (Honours)

Paper Code : III-A

[New Syllabus]

Full Marks : 20

Time : Thirty Minutes

### *Important Instructions for OMR Sheet*

1. Write / Fill your correct Subject Name, Subject Code & Paper Code in the space provided on the top of the OMR sheet (Subject Codes are given on the back of the OMR sheet & Paper Code in the Question Paper.)
2. Write / Fill your Roll number, Registration number, Regn. Session, Exam Date and Exam Session in the space provided on the OMR Sheet.
3. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.
4. Your responses to the items are to be indicated in the **OMR Sheet given inside the Paper Booklet only**. If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
5. If you write your Name, Phone Number or put any mark on any part of the OMR Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, you will render yourself liable to disqualification.
6. You have to return the OMR Sheet to the invigilators at the end of the examination compulsorily and must not carry it with you outside the Examination Hall.
7. **Use only Blue/Black Ball point pen. Use of any mobile phone, calculator or log table etc. in examination hall, is prohibited.**

3/111 - 800

Answer *all* the questions in OMR sheet.

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  $K = 2$  unit and  $L = 10$  units ?
  - (A) 12
  - (B) 36
  - (C) 10
  - (D) 2
2. If  $MR = 10$  and  $AR = 2$ , what is the value of price elasticity of demand ?
  - (A)  $\frac{1}{8}$
  - (B)  $-\frac{1}{4}$
  - (C) 1
  - (D) 0

*Turn Over*

3. The demand function  $q = 30 - 4p - p^2$ . If the commodity is free good then what is the value of  $q$  ?
- (A) 30  
 (B) 26  
 (C) 20  
 (D) 0
4. If 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
5. In a multiplant monopolist the profit ( $\pi$ ) is \_\_\_\_\_ .  
 (Where  $R_1$  and  $R_2$  are the revenues of the two markets) :
- (A)  $\pi = R_1(q_1) - C(q_1 + q_2)$   
 (B)  $\pi = R_1(q_1) + R_2(q_2) - C(q_1 + q_2)$   
 (C)  $\pi = R_2(q_2) - C(q_1 + q_2)$   
 (D) None of the above

6. In the game theory, the value of the game is zero then

- (A) maximin = minimax = 0
- (B) maximin = minimax = 1
- (C) maximin > minimax
- (D) maximin < minimax

7. What is the value of elasticity of demand (e) if MR is zero ?

- (A)  $e > 1$
- (B)  $e < 1$
- (C)  $e = 1$
- (D)  $e = 0$

8. If the cost function  $C = 15q - 6q^2$ , what is the value of AC at  $q = 2$  ?

- (A) 3
- (B) 2
- (C) 6
- (D) 15

*Turn Over*

9. Consider the game with the following pay off matrix. Find the value of the game.

		<i>P-B</i>			
		<i>B</i> <sub>1</sub>	<i>B</i> <sub>2</sub>	<i>B</i> <sub>3</sub>	<i>B</i> <sub>4</sub>
<i>P-A</i>	<i>A</i> <sub>1</sub>	3	-1	4	2
	<i>A</i> <sub>2</sub>	-1	-3	-7	0
	<i>A</i> <sub>3</sub>	4	-6	2	-9

- (A) -1  
 (B) 2  
 (C) 3  
 (D) 4
10. Let the equation of an iso quant be  $q = f(x_1, x_2)$ . Find the slope of the iso quant.
- (A)  $\frac{dx_1}{dx_2} = -\frac{f_1}{f_2}$   
 (B)  $\frac{dx_1}{dx_2} = f_1 \cdot f_2$   
 (C)  $\frac{dx_1}{dx_2} = \frac{f_2}{f_1}$   
 (D) None of the above

P-II (1+1+1) H / 17(N)

2017

**ECONOMICS (Honours)**

Paper Code : III-B

[New Syllabus]

Full Marks : 80

Time : Three Hours Thirty Minutes

*The figures in the margin indicate full marks.*

**Group - A**

[Short Answer type questions]

Answer any *four* questions.

1. Consider a three sector economy

$$C = 5 + 0.5Y_d$$

$$I = 85$$

$$T = 10$$

$$G = 15$$

- (i) Find the equilibrium level of national income.
- (ii) Calculate the change in equilibrium of level of income if Govt. expenditure increased by 10 unit.
- (iii) Find the value of tax multiplier. 3+3+4

*Turn Over*

2. Consider the production function  $Q = AK^\alpha L^\beta$
- Verify Euler's theorem for this function.
  - Show that the elasticity of substitution ( $\sigma$ ) between Labour (L) and capital (K) is unity. 5+5
3. Given that  $\frac{dP}{dt} = 2(D - S)$  examine the stability of the following market
- $$D = 2 - 2P$$
- $$S = -4 + 4P$$
- 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. From the following information find the final output of each industry satisfy the specified bill of final consumption. 10

	x	y	z	Bill of final consumption
x	0.3	0.2	0.2	80
y	0.2	0.1	0.5	30
z	0.2	0.4	0.2	50

6. Distinguish between
- two-person zero sum game
  - two-person constant sum game. 10

Consider the game with the following pay off matrix

		Player-B	
		$B_1$	$B_2$
Player-A	$A_1$	$\begin{bmatrix} -2 & 6 \end{bmatrix}$	
	$A_2$	$\begin{bmatrix} -2 & \lambda \end{bmatrix}$	

- (i) Show that the game is strictly determinable whatever  $\lambda$  may be.
- (ii) Determine the value of game. 5+5
8. (i) For an economy following consumption function is given  $C = 60 + 0.75Y$ . If investment in a year is Rs. 75 crores, what will be the equilibrium level of income ?
- (ii) Assume that in a duopoly market the demand function is  $P = 100 - 0.5(q_1 + q_2)$  and the costs are  $C_1 = 2.5q_1$  and  $C_2 = 0.25q_2^2$  find the reaction functions. 5+5

**Group - B**

[Essay type questions]

Answer any *two* questions.

9. (i) Prove that the elasticity of substitution ( $\sigma$ ) of the CES production function is constant.
- (ii) If the marginal revenue function is  $P_m = \left\{ \frac{ab}{(x+b)^2} - C \right\}$ , show that

$$P = \left\{ \frac{a}{x+b} - C \right\} \text{ is the demand law.} \quad 10+10$$

*Turn Over*



10. (i) Solve the following differential equation when  $y(0)=10$ ,  $y'(0)=12$

$$\frac{d^2y}{dt^2} + 7\frac{dy}{dt} + 6y = 7.$$

- (ii) Examine the dynamic stability of the equation  $y_{t+2} - 11y_{t+1} + 10y_t = 27$   
10+10

11. (i) A firm produces two products  $X$  and  $Y$ . The profit per unit of  $X$  and  $Y$  are Rs. 5 and 6 respectively. Each product passes through two processes. Product  $X$  requires 1 hour of Process-I and 2 hours of process-II per unit. Product  $Y$  requires 1 hour of process-I and 3 hours of process-II per unit. The firm has a capacity of 5 hours of Process-I and 12 hours of Process-II.

(a) Form the LPP.

(b) Determine the solution by graphical method.

(c) Write down its dual problem.

3+4+3

- (ii) Given input coefficient matrix  $A = \begin{bmatrix} 0.2 & 0.3 & 0.2 \\ 0.4 & 0.1 & 0.2 \\ 0.1 & 0.3 & 0.2 \end{bmatrix}$  and the final

demand Vector  $C = \begin{bmatrix} 10 \\ 5 \\ 6 \end{bmatrix}$ . Find the output levels of three industries.

10

12. Given the demand function  $P = 20 - q$  and the total cost function  $C = q^2 + 8q + 2$ .

- (i) What output maximise total profit and what are the corresponding values of price, and profit ?
  - (ii) What output maximises sales and what are the corresponding values of price and sales ?
- 10+10