

## ENTRANCE EXAMINATION, 2012

M.A. ECONOMICS (with specialisation in the World Economy)

[ Field of Study Code : EILM (202) ]

Time Allowed : 3 hours

Maximum Marks : 100

## INSTRUCTIONS FOR CANDIDATES

Candidates must read carefully the following instructions before attempting the Question Paper :

- (i) Write your Name and Registration Number in the space provided for the purpose on the top of this Question Paper and in the Answer Sheet.
- (ii) **Please darken the appropriate Circle of Question Paper Series Code on the Answer Sheet.**
- (iii) All questions are compulsory.
- (iv) Answer all 25 questions in the Answer Sheet provided for the purpose by darkening the correct choice, i.e., (a) or (b) or (c) or (d) with BALLPOINT PEN only against the corresponding circle. Any overwriting or alteration will be treated as wrong answer.
- (v) Each correct answer carries 4 marks. **There will be negative marking and 1 mark will be deducted for each wrong answer.**
- (vi) Answer written by the candidates inside the Question Paper will not be evaluated.
- (vii) Calculators may be used.
- (viii) Please use the space provided for Rough Work.
- (ix) Return the Question Paper and Answer Sheet to the Invigilator at the end of the Entrance Examination. **DO NOT FOLD THE ANSWER SHEET.**

## INSTRUCTIONS FOR MARKING ANSWERS

1. Use only Blue/Black Ballpoint Pen (do not use pencil) to darken the appropriate Circle.
2. Please darken the whole Circle.
3. Darken **ONLY ONE CIRCLE** for each question as shown in example below :

Wrong	Wrong	Wrong	Wrong	Correct
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6. Please do not do any rough work on the Answer Sheet.
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8. **Ensure that you have darkened the appropriate Circle of Question Paper Series Code on the Answer Sheet.**

1. Suppose the demand function for wheat is  $Q_d = 10 - 2p$  and supply function is  $Q_s = 3p - 5$ . The government is concerned that the market equilibrium price of wheat is too low and would like to implement a price support policy to protect the farmers. By implementing the price support policy, the government sets a support price  $p_s = 4$  and purchases the extra supply at the support price. The gain in producer surplus at the support price  $p_s = 4$  is
- (a) 20
  - (b) 28
  - (c)  $11/2$
  - (d)  $22/3$
2. For the problem in Q1, the change in consumer surplus of implementing support price is
- (a) 14
  - (b) 10
  - (c) 3
  - (d) 5
3. For the problem in Q1, the cost to the government of this policy is
- (a) 21
  - (b) 20
  - (c) 14
  - (d) 10

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SPACE FOR ROUGH WORK

4. With regard to Q1, suppose now the government switches from price support policy to subsidy policy. For each unit of corn produced, the government subsidizes the farmer  $s = 5/3$ . How much money will the government have to spend in order to implement this subsidy policy?
- (a) 10
  - (b) 21
  - (c) 15
  - (d)  $10/3$
5. Which of the following will cause total revenue earned by cell phone producers to rise?
- (a) The demand is price-elastic and the price falls.
  - (b) The price falls and demand is inelastic.
  - (c) Demand is reduced because consumers learn of new hazards of cell phone use.
  - (d) The population in the economy increases dramatically.
6. Suppose the elasticity of demand for an iPod is  $-3.5$ . This means that
- (a) the demand for iPods is inelastic
  - (b) the demand curve for iPods is very steep.
  - (c) 10 percent increase in the price of iPods will cause quantity demanded to rise by 35%.
  - (d) 10 percent increase in the price of iPods will cause quantity demanded to fall by 35%.

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SPACE FOR ROUGH WORK

7. Any point outside the PPF (or PPC)
- (a) is not feasible, given current resources and technology
  - (b) represents efficient use of the economy's resources
  - (c) represents inefficient use of the economy's resources
  - (d) None of the above
8. If Britannia hires another worker, Britannia will be able to deliver an additional 20 packages an hour. The price of each package is Rs 5. The marginal revenue product (MRP) of this additional worker is equal to
- (a) Rs 5
  - (b) Rs 100
  - (c) Rs 4
  - (d) 20 packages
9. If the total output of candles in Nick's Wicks shop increases from 20 per hour to 30 per hour as he hires the second worker, then
- (a) the marginal product of the second worker is 20 candles
  - (b) the marginal product of the second worker is 30 candles
  - (c) if the price of each candle is Rs 2, the marginal revenue product (MRP) of the second worker is Rs 20
  - (d) if the price of each candle is Rs 2, the marginal revenue product (MRP) of the second worker is Rs 30

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SPACE FOR ROUGH WORK

10. Minimize  $y = x_1 + x_2$  subject to  $1 - x_1^{1/2} - x_2 = 0$

(a)  $x_1^* = 1/4, x_2^* = 1/2$

(b)  $x_1^* = 1/4, x_2^* = 1$

(c)  $x_1^* = 4, x_2^* = 2$

(d)  $x_1^* = 1/2, x_2^* = 1/4$

11. The function  $f: \mathbb{R} \rightarrow \mathbb{R}$  defined by  $f(x) = \frac{x^2 + 2x - 3}{x^2 - x - 2}$  has

(a) two points of discontinuity at  $x = -2$  and  $x = -1$

(b) a single point of discontinuity at  $x = -1$

(c) a single point of discontinuity at  $x = -2$

(d) two points of discontinuity at  $x = 2$  and  $x = -1$

12. The rank of the matrix  $C = AB$ , where  $A = \begin{pmatrix} 3 & 1 & 1 \\ 1 & 2 & 1 \end{pmatrix}$  and  $B = \begin{pmatrix} 4 & 5 & 0 \\ 1 & 3 & 2 \\ 2 & 0 & 6 \end{pmatrix}$  is

(a) 0

(b) 1

(c) 2

(d) 3

13. The probabilities that  $A$  and  $B$  speak the truth independently are  $p$  and  $q$  respectively. If they make the same statement, the probability that the statement is indeed true is

(a)  $\frac{pq}{pq + \frac{1}{2}(1-p)(1+q)}$

(b)  $\frac{pq}{pq + (1-p)(1-q)}$

(c)  $\frac{pq}{pq + (1-p)(1+q)}$

(d)  $\frac{2pq}{pq + (1-p)(1+q)}$

14. The probabilities of solving a problem by 3 students are  $\frac{3}{7}$ ,  $\frac{3}{8}$  and  $\frac{1}{3}$  respectively. If each one of them tries to solve it independently, then the probability that the problem is not solved is

(a)  $\frac{2}{8}$

(b)  $\frac{3}{7}$

(c)  $\frac{4}{21}$

(d)  $\frac{5}{21}$

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SPACE FOR ROUGH WORK

15. The probability mass function  $p(x)$  of a random variable  $X$  is zero except at points  $X = 0, 1, 2$  and  $3$ . If  $C$  is a constant such that

$$p(0) = \frac{C}{2}, p(1) = 2C - 3C^2, p(2) = 2C - 1, p(3) = \frac{C}{2}$$

then

- (a)  $C = 1$  and  $C = 2/3$   
(b)  $C = 1$   
(c)  $C = 2/3$   
(d)  $C = 3/2$
16. The mean daily profit of a shopkeeper in a month of 30 days was Rs 650. The mean profit for the first two weeks was Rs 575 and the mean profit for the third week was Rs 400. His mean profit for the remaining days was
- (a) Rs 325.20 (b) Rs 961.11  
(c) Rs 100.00 (d) Rs 923.25
17. The distribution of the number of printing mistakes per page of a book is Poisson with mean 3. Given that  $e^{-3} = 0.049787$ , the probability that there is some mistake in a page is
- (a) 0.049787 (b) 0.950212  
(c) 0.905020 (d) None of the above





21. Consider the following form of the IS-LM model, where expected inflation is zero ( $\pi^e = 0$ ) and net exports ( $NX$ ) are also zero :

$$C = c_0 + c_1(Y - T)$$

$$I = b_0 + b_1Y - b_2i$$

$$\frac{M^d}{P} = d_1 - d_2i$$

$$M^s = M$$

where  $C$  is the consumption,  $Y$  is the income,  $T$  represents taxes,  $I$  is the investment,  $i$  is the rate of interest,  $M^d$  is the money demand,  $P$  is the price level and  $M^s$  is money supply. Let  $G$  denote government spending. Then, the short-equilibrium pair  $(Y, i)$  that makes goods and money market to be in equilibrium at the same time is

$$(a) \quad i^* = \frac{md_1(c_0 - c_1T + G) - \frac{M}{P}}{b_2md_1 + d_2}; \quad Y^* = \frac{1}{d_1} \left[ \frac{M}{P} + d_2 \frac{md_1(c_0 - c_1T + G) - \frac{M}{P}}{b_2md_1 + d_2} \right]$$

$$(b) \quad i^* = \frac{md_1(c_0 - c_1T + b_0 + G) - \frac{M}{P}}{b_2md_1 + d_2}; \quad Y^* = \frac{1}{d_1} \left[ \frac{M}{P} + d_2 \frac{md_1(c_0 - c_1T + b_0 + G) - \frac{M}{P}}{b_2md_1 + d_2} \right]$$

$$(c) \quad i^* = \frac{md_2(c_0 - c_1T + b_0 + G) - \frac{M}{P}}{b_2md_2 + d_1}; \quad Y^* = \frac{1}{d_2} \left[ \frac{M}{P} + d_1 \frac{md_2(c_0 - c_1T + b_0 + G) - \frac{M}{P}}{b_1md_2 + d_1} \right]$$

$$(d) \quad i^* = \frac{m(c_0 - c_1T + b_0 + G) - \frac{M}{P}}{b_2m + d_2}; \quad Y^* = \left[ \frac{M}{P} + d_2 \frac{m(c_0 - c_1T + b_0 + G) - \frac{M}{P}}{b_2m + d_2} \right]$$

Note that we define  $m = \frac{1}{1 - b_1 - c_1}$ ,  $b_1 + c_1 < 1$

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SPACE FOR ROUGH WORK

22. The optimal trade policy for a country is always

- (a) free trade
- (b) restricted trade with tariff
- (c) subsidies
- (d) Can't say

23. The maximum amount of food and cloth that two countries A and B can produce using all of the factors of production in their respective countries with the best available technology is given below in the table :

	A	B
Food	500	1200
Cloth	700	800

Suppose A and B agree to a terms of trade ratio of 1 : 1 (i.e., 1 unit of food to be exchanged for 1 unit of cloth), then the specialization and trade pattern would be as follows

- (a) A will specialize in food and export food, and import cloth from B
- (b) A will specialize in cloth, and export cloth and import food from B
- (c) A and B will not trade
- (d) A has no comparative advantage and will import food and cloth from B

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SPACE FOR ROUGH WORK

21. The table below gives the demand and supply schedules for computers in a small country :

<i>Price per Computer (\$)</i>	<i>Quantity Demanded</i>	<i>Quantity Supplied</i>
100	900	0
200	700	200
300	500	400
400	300	600
500	100	800

Under free trade the country was importing computers at a price of 100, but now imposes a quota that limits imports to 300 computers. The price will go up by

- (a) \$ 250
  - (b) \$ 200
  - (c) \$ 150
  - (d) \$ 100
25. If the marginal propensity to save is 0.15 and the marginal propensity to import is 0.05, then the multiplier effect on GDP is
- (a) 6.67
  - (b) 5.00
  - (c) 4.31
  - (d) None of the above

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1. Sam consumes only two goods  $X$  and  $Y$ . If  $X$  is a Giffen good for Sam, then
  - (a)  $Y$  must be a Giffen good for Sam
  - (b)  $Y$  must be a normal good for Sam
  - (c) Both (a) and (b) are false
  - (d) Both (a) and (b) are true
  
2. Mary's demand curve for food is  $Q = 10 - 2P$ . Her price elasticity of demand for food at price  $P^*$  is equal to  $-\frac{2}{3}$ . Find  $P^*$ .
  - (a) 2
  - (b) 4
  - (c) 1
  - (d) None of the above
  
3. In a country, cigarettes are forbidden, so people trade cigarettes in a black market. The cigarette demand is  $Q_D = 12 - P$  and the cigarette supply is  $Q_S = 2P$ . The government becomes aware of the black market and reinforces the police so that half of the cigarette supply would be seized and destroyed. How does the consumer surplus change between the two situations?
  - (a) Remains the same
  - (b) Decreases by 10
  - (c) Decreases by 14
  - (d) Increases by 8
  
4. Cournot duopolists face a market demand curve  $P = 56 - 2Q$ , where  $Q$  is total market demand. Each can produce output at a marginal cost of Rs 20 (constant). The equilibrium price and firm quantity are
  - (a) 26, 6
  - (b) 30, 6.5
  - (c) 36, 10
  - (d) 32, 6
  
5. Let the utility function be  $U = x \cdot y^2$ , where  $x$  and  $y$  are two consumption goods. The prices of the two goods and money income are  $p_x = 2$ ,  $p_y = 3$ ,  $M = 9$ . The optimal quantities consumed of the two goods are
  - (a)  $x = 2$ ,  $y = \frac{3}{2}$
  - (b)  $x = 2$ ,  $y = 4$
  - (c)  $x = \frac{3}{2}$ ,  $y = 2$
  - (d)  $x = \frac{3}{2}$ ,  $y = \frac{3}{2}$

Two urns, contain red and blue balls. The first urn has 3 red and 7 blue balls, while the second urn has 6 red and 4 blue balls. An urn is selected at random and a ball is drawn from this urn. If the ball is red, the conditional probability that it was drawn from the second urn is

- (a)  $\frac{1}{2}$
- (b)  $\frac{3}{10}$
- (c)  $\frac{2}{3}$
- (d) More information is required

9. The probability density function of a random variable  $x$  is given as  $\frac{1}{x^2}$ , where  $1 < x < \infty$ . If the set  $A = \{x; 1 < x < 2\}$  and the set  $B = \{x; 4 < x < 5\}$ , the probability  $A \cup B$  is

- (a)  $\frac{1}{20}$
- (b)  $\frac{9}{20}$
- (c) 0
- (d)  $\frac{11}{20}$

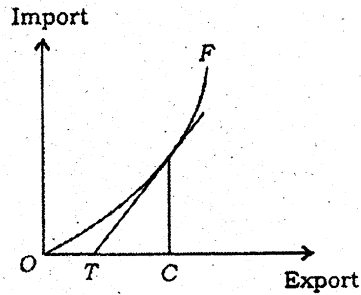
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- (a)  $\frac{1}{20}$
- (b)  $\frac{9}{20}$
- (c) 0
- (d)  $\frac{11}{20}$

10.



For the above offer curve  $OF$ , the absolute value of the elasticity of demand for imports is measured by

- (a)  $OT/TC$
  - (b)  $OC/TC$
  - (c)  $OC/OT$
  - (d)  $CT/OT$
11. The necessary and sufficient conditions for the factor price equalisation in the Heckscher-Ohlin model is
- (a) factor intensity reversal
  - (b) incomplete specialization
  - (c) non-constant returns to scale
  - (d) dissimilar production function
12. Restricted trade is superior to free trade for
- (a) a small country
  - (b) a large country
  - (c) any country—small or large
  - (d) Cannot say
13. Quantities of labour embodied per unit of goods  $X_1$  and  $X_2$  in country A are given by 0.3 and 0.7, while the same for country B are given by 0.2 and 0.9. Country A, therefore, enjoys comparative advantage in
- (a)  $X_1$
  - (b)  $X_2$
  - (c) Neither  $X_1$  nor  $X_2$
  - (d) Both  $X_1$  and  $X_2$
14. In the standard IS-LM framework, an equal and simultaneous reduction in  $G$  and  $T$  will cause
- (a) an increase in investment
  - (b) no change in output
  - (c) reduction in output
  - (d) increase in interest rate

15. Consider an economy described by the following equations :

$$C = C_0 + 0.8 Y_d \quad T = T_0 + 0.25Y \quad Y = C + I + G$$

Where  $Y_d = Y - T$  is the disposable income. Given this information, what is the change in the national income if the government reduces autonomous taxes by 50 (i.e.,  $\Delta T_0 = -50$ )?

- (a) Increases by 100.  
 (b) Decreases by 100  
 (c) Increases by 125  
 (d) Decreases by 125
16. Consider the following aggregate demand system :

$$M^d = AD - r \quad \frac{M^d}{P} = \frac{M^s}{P} \quad AD = C + I + G \quad C = 1 + 0.5Y \quad I = 1 - 0.5Y$$

Derive the equations for the IS and LM curves.

- (a)  $Y = 8 + r - G$ ;  $Y = \frac{4M^s}{P} - 2 - 2G - 6r$   
 (b)  $Y = 4 + r - 2G$ ;  $Y = \frac{2M^s}{P} + 4 + 2G - 3r$   
 (c)  $Y = 4 - r + 2G$ ;  $Y = \frac{2M^s}{P} - 4 - 2G + 3r$   
 (d)  $Y = 2 - r + 4G$ ;  $Y = \frac{M^s}{P} + 2 + G - r$
17. In an open economy the IS curve has a slope that is
- (a) steeper than its counterpart in the closed economy  
 (b) flatter than its counterpart in the closed economy  
 (c) same as the closed economy  
 (d) steeper or flatter than the closed economy depending on whether net exports is positive or negative
18. Consider the basic Solow model for this question. Suppose two countries A and B are identical in all aspects except that A's saving rate is lower than B's. In the long run
- (a) income per person will be higher in A than in B  
 (b) income per person will be lower in A than in B  
 (c) income per person will be the same in both A and B  
 (d) It is not possible to compare income per person in the two countries based on the saving rates
19. With fixed exchange rates, fiscal expansion will lead to an increase in output that is
- (a) the same as in the case of flexible exchange rate  
 (b) higher than in the case of flexible exchange rate  
 (c) lower than in the case of flexible exchange rate  
 (d) Cannot say



20. The probability density function of a random variable  $y$  is  $\alpha y(1 - y)^2$  for  $y$  lying between 0 and 1 ( $\alpha$  is a constant). Find the probability of  $y$  lying between 0.25 and 0.75.
- (a) 0.2234
  - (b) 0.0000
  - (c) 0.9876
  - (d) 0.6875

21. The function  $f : \mathbb{R} \rightarrow \mathbb{R}$  defined by

$$f(x) = \begin{cases} 1 & \text{if } |x| \leq 1 \\ 2x & \text{if } |x| > 1 \end{cases}$$

is

- (a) convex and continuous on  $[-1, \infty)$
- (b) convex and continuous on  $[-1, 1]$
- (c) convex and continuous on  $(-\infty, 1]$
- (d) None of the above

22. The consumption set

$$C = \{(x, y) \in \mathbb{R}_+^2; x \geq x^0 > 0 \text{ and } y \geq y^0 > 0\}$$

is

- (a) bounded
- (b) convex
- (c) convex and bounded
- (d) Neither convex nor bounded

23. Find the determinant of the following matrix :

$$A = \begin{pmatrix} 1 & 2 & 3 \\ 0 & 1 & -1 \\ 1 & 2 & 1 \end{pmatrix}$$

- (a) 1
- (b) -1
- (c) 2
- (d) -2

24. Find the producer surplus for a profit maximising firm with the marginal cost function  $MC(q) = 2q + 1$ , when price is  $p_0 = 10$ .

- (a) 22.50
- (b) 25.20
- (c) 20.25
- (d) 22.20

25. The utility function

$$U(x) = \frac{x^\alpha - 1}{\alpha}; \quad 0 < \alpha \leq 1; \quad x \in \mathbb{R}_+$$

is

- (a) concave and increasing
- (b) convex and increasing
- (c) concave and decreasing
- (d) convex and decreasing

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Time Allowed : 3 hours

Maximum Marks : 100

All the questions have to be answered, although there is an internal choice in Question No. 5. Too lengthy an answer will be penalized.

1. (a) State with *adequate reasoning* if the following statements are True or False :
- (i) Consider a utility function  $U(x_1, x_2) = u(x_1) + x_2$ . The income effect on the first commodity (whose quantity is measured by the variable  $x_1$ ) is zero. 5
- (ii) Own and cross substitution effects are always negative. 5
- (b) Calculate the Lerner's index when the demand function is given by  $q = kp^{-e}$ ,  $k > 0$ , where  $q$  and  $p$  represent quantity and price respectively. 10
- (Note that Lerner's index is a measure of price margin.)
2. Consider an economy characterized by the following relationships :

$$C = 500 + 0.4 * Y_d$$

$$I = 100 + 0.1 * Y - 5000 * i$$

$$G = 200 \text{ and } T = 200$$

$$\left(\frac{M}{P}\right)^D = \frac{Y}{10 * i}$$

$$\left(\frac{M}{P}\right)^S = 1000$$

where  $C$  is consumption,  $I$  is investment,  $G$  is government spending,  $T$  are taxes,  $Y$  is real income,  $Y_d$  is disposable real income,  $i$  is the interest rate,  $\left(\frac{M}{P}\right)^D$  is the real money demand and  $\left(\frac{M}{P}\right)^S$  is the real money supply.

- (a) Calculate the equilibrium real income and the interest rate in this economy. 10

- (b) Now assume that the Central Bank increases the real money supply to 2000. What is the change in the real income and the interest rate under this policy? Provide the economic rationale. 10
3. (a) What is factor intensity reversal? Critically evaluate (with diagrams) the validity of the Heckscher-Ohlin theory of trade in the presence of such reversal. 10
- (b) What are the invisibles in the balance of payments? Examine the mechanism and the implication of the fixed and the flexible exchange rate systems to achieve the equilibrium in the balance of payments. 10
4. (a) (i) Consider the set  $A \subset \mathbb{R}^2$  (that is,  $A$  is a subset of  $\mathbb{R}^2$ ) as defined by the following :

$$A = \{(x, y) \in \mathbb{R}_+^2 : 1 < x < 7, y = x\}$$

Draw the set  $A$  in the  $xy$ -plane. Is this set open? Is it bounded? 5

(ii) Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  be defined by

$$f(x) = \begin{cases} x^2, & x \leq 1 \\ \frac{3}{2}, & x > 1 \end{cases}$$

Find the limit,  $\lim_{x \rightarrow 1} f(x)$ . Is this function continuous at  $x = 1$ ? Is it continuous on  $[0, 1]$ ? Is it continuous on  $[1, 2]$ ? 5

- (b) (i) A random variable  $X$  has a uniform distribution (rectangular distribution) in the range  $(-5, 10)$ . Obtain  $\Pr(|X| > 4)$ . 5
- (ii) For a discrete random variable  $X$ , it is given that  $\Pr(X = 0) = \Pr(X = 2) = p$ , and  $\Pr(X = 1) = 1 - 2p$ , where  $0 \leq p \leq \frac{1}{2}$ . Find the value of  $p$  that maximizes the variance of  $X$ . 5

5. Answer any one of the following questions (in not more than 500 words) : 20

- (a) "International cooperation/coordination of policy responses is needed to deal with the problem of global warming and climate change." Discuss giving economic arguments.
- (b) Is the government's response to the concerns about recent trends in food price inflation in India adequate? What additional fiscal, monetary and trade policies could be proposed to deal with it?

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