

# INSTITUTE OF ACTUARIES OF INDIA

## EXAMINATIONS

18<sup>th</sup> May 2009

Subject CT7 - Economics

**Time allowed: Three Hours (14.30 to 17.30 Hrs)**

**Total Marks: 100**

### *INSTRUCTIONS TO THE CANDIDATES*

- 1) *Please read the instructions on the front page of answer booklet and instructions to examinees sent along with hall ticket carefully and follow without exception*
- 2) *Mark allocations are shown in brackets.*
- 3) *Attempt all questions, beginning your answer to each question on a separate sheet. However, answers to objective type questions could be written on the same sheet.*
- 4) *In addition to this paper you will be provided with graph paper, if required.*

### **AT THE END OF THE EXAMINATION**

**Please return your answer book and this question paper to the supervisor separately.**

- Q. 1)** For a price-taking firm in both the input and output markets, the MRP curve for labour eventually slopes downward because:
- A.** of the diminishing marginal productivity of labour
  - B.** the output price falls as the output level rises
  - C.** the wage rate rises as the amount of labour rises
  - D.** Both A and B are correct
- [1.5]**
- Q. 2)** Ram's preferences satisfy the non-satiation assumption. This means that he must prefer the bundle consisting of two glasses of juice and one apple to which of the following bundles?
- A.** One glass of juice and two apples.
  - B.** Three glasses of juice and one apple.
  - C.** Three glasses of juice and no apples.
  - D.** One glass of juice and one apple.
- [1.5]**
- Q. 3)** The value of price elasticity of demand:
- A.** depends on the units that are used to measure quantities
  - B.** has the same value as the slope of the demand curve
  - C.** depends on the units that are used to measure prices
  - D.** does not depend on the units in which quantity and price are measured.
- [1.5]**
- Q. 4)** Demand for a good is likely to be more elastic:
- A.** the smaller the fraction of consumer income absorbed by the good
  - B.** in the short run than in the long run
  - C.** the more broadly defined the good
  - D.** the greater the number of available substitutes for the good
- [1.5]**
- Q. 5)** A bicycle shop is planning on increasing the price of one of the bicycles it sells. The bicycle shop would hope that
- A.** the price of substitute goods would decrease
  - B.** the price of complement goods would increase
  - C.** the price of complement goods would decrease
  - D.** the demand for the good is elastic
- [1.5]**

- Q. 6)** The long-run equilibrium point occurs for a perfectly competitive firm at what point?
- A.** Average fixed cost equals marginal cost
  - B.** Average fixed costs are at a minimum
  - C.** Average variable costs are at a minimum
  - D.** Average total cost are at a minimum
- [1.5]**
- Q. 7)** The difference between the short run and long run are:
- A.** In the short run costs are variable while in the long costs are fixed
  - B.** In the short run firms have free exit and entry while in the long run there are barriers to entry and exit of the market
  - C.** In the short run profits are made while in the long run the market is in equilibrium
  - D.** In the short run prices are set, while in the long run prices are variable.
- [1.5]**
- Q. 8)** All of the following cost curves are U-shaped except
- A.** AVC curve
  - B.** MC curve
  - C.** AFC curve
  - D.** AC curve
- [1.5]**
- Q. 9)** The production-possibility curve shifts outward when
- A.** unemployed resources are called back to work.
  - B.** there is an increase in the opportunity cost of a good.
  - C.** there is a technological advance.
  - D.** increased drug use decreases the skills of the labor force.
- [1.5]**
- Q. 10)** When negative externalities are present, a market will \_\_\_\_\_.
- A.** always reach an efficient solution
  - B.** reach an efficient solution if transaction costs are low
  - C.** reach an efficient solution only if the government intervenes in the market
  - D.** reach an efficient solution only if the negative externalities are offset by positive externalities
- [1.5]**

- Q. 11)** A dominant strategy equilibrium exists in a game when
- A. every player has no choice
  - B. every player makes the same choice, regardless of the action of the other players
  - C. each player makes the best choice, given the choice of the other player
  - D. no player is able to dictate the actions of any other player
- [1.5]**
- Q. 12)** A firm is currently producing in the inelastic portion of its demand curve. What course of action should you recommend to this firm?
- A. Continue selling at the same price, but increase the number of units it produces.
  - B. Reduce price, because if demand is inelastic and price is reduced, total revenue will increase.
  - C. Increase price, because if demand is inelastic and price is increased, total revenue will increase.
  - D. Continue producing at the current output level, because the firm will maximize its total revenue by producing in the inelastic portion of its demand curve.
- [1.5]**
- Q. 13)** If a forecasted drought is expected to ruin the upcoming coffee crop, then we would anticipate that the price of
- A. tea will rise.
  - B. coffee creamer will fall.
  - C. coffee will rise.
  - D. All of the above
  - E. None of the above
- [1.5]**
- Q. 14)** Suppose that automobile workers were to negotiate a very large wage increase. As a result, the equilibrium price of automobiles would \_\_\_\_\_, and the equilibrium quantity of automobiles would \_\_\_\_\_.
- A. decrease; decrease
  - B. increase; increase
  - C. decrease; not change
  - D. increase; decrease
  - E. decrease; increase
- [1.5]**

- Q. 15)** Which of the following is NOT associated with Keynesian economics?
- A. The marginal propensity to consume.
  - B. The autonomous expenditure multiplier.
  - C. The vertical long run aggregate supply curve.
  - D. The speculative demand for money
- [1.5]**
- Q. 16)** Which one of the following pairs is called an open market operation?
- A. Selling and buying of securities or bills by the central bank
  - B. Selling and buying of foreign exchange
  - C. Selling and buying of shares by the foreign institutional investors
  - D. Selling and buying of gold in the open market by commercial banks
- [1.5]**
- Q. 17)** Which of the following does not work as an Automatic stabilizer to pull an economy back from recession:
- A. High PSNCR
  - B. Low interest rate
  - C. Low capital investment
  - D. Stock building
- [1.5]**
- Q. 18)** The part of money held in an individual portfolio to meet unexpected contingencies is for:
- A. Precautionary purpose
  - B. Speculative purpose
  - C. Insurance purpose
  - D. None of these
- [1.5]**
- Q. 19)** A marginal propensity to consume is:
- I. the inverse of the multiplier
  - II. the percentage change in consumption divided by the percentage change in household income
  - III. that the fraction of each extra rupee of income that household spend on consumption
- A. I and II
  - B. II and III
  - C. I only
  - D. III only
- [1.5]**

- Q. 20)** During recession, which of the following can be regarded as a set of Keynesian policies to stimulate aggregate demand upward?
- A. A restrictive monetary policy coupled with a freeze on public sector wages
  - B. An increased budget deficit, hike in unemployment benefit and tax cut
  - C. A balanced budget, a long term prices and income policy and stable money supply
  - D. An increased budget deficit, tax cut and increased interest rate [1.5]
- Q. 21)** What kind of change is to be made in  
(1) Cash reserve ratio, and (2) Bank rate, to control inflation?
- A. 1 should increase but 2 should decrease
  - B. 2 should increase but 1 should decrease
  - C. Both should increase
  - D. Both should decrease [1.5]
- Q. 22)** There are a number of banks in a country. The initial total primary deposit is Rs. 1,000. Every bank is required to maintain a cash reserve ratio of 10%. All the transactions are completely made through cheque and no transaction is made in cash. What will be the total credit creation in the Country?
- A. Rs. 1,000
  - B. Rs. 5,000
  - C. Rs. 10,000
  - D. None of the above [1.5]
- Q. 23)** In a country with a rising population nominal Gross Domestic Product (GDP) increases at a rate of 3% per annum while the GDP deflator increases at 2% per annum. Which of the following MUST be true?
- A. Real GDP per capita falls
  - B. Real GDP per capita rises
  - C. Real GDP falls
  - D. Real GDP rises [1.5]
- Q. 24)** In an open economy, the three leakages from the circular flow of income are:
- A. Investment, Government expenditure and Exports
  - B. Savings, Government expenditure and Imports
  - C. Savings, Taxes and Imports
  - D. Savings, Taxes and Exports [1.5]

**Q. 25)** In a country in which indirect taxes exceeds subsidies, which of the following statements about national income is always true:

- I.  $GNP > GDP$
- II.  $GNP > NNP$
- III.  $NNP \text{ at market price} > NNP \text{ at basic price}$

- A. I and II
- B. II and III
- C. I only
- D. III only

[1.5]

**Q. 26)** Under a fixed exchange rate system the following approaches might be considered by the governments to correct a balance of payments deficit.

- I. Discouragement of imports.
- II. Support for exporters.
- III. Increase the level of aggregate demand.

Which of the following is most likely to achieve this objective?

- A. I only.
- B. II only.
- C. I and II only.
- D. I, II and III.

[1.5]

**Q. 27)** Assuming the Marshall-Lerner condition holds, which of the following policies cannot be used to correct an adverse trade balance:

- A. reduce aggregate demand in the domestic economy
- B. revalue the domestic currency
- C. provide export credit insurance to domestic firms
- D. encourage people to buy goods produced in the home country

[1.5]

**Q. 28)** A tax that increase aggregate demand when economy is going through a downswing in the trade cycle and decrease aggregate demand when economy is experiencing a upswing in trade cycle would be an example of :

- A. a negative income tax
- B. a direct tax
- C. a progressive tax
- D. an automatic stabilizer

[1.5]

**Q. 29)** What is the Cash Reserve Ratio (CRR) and how can it be used as a tool to control money supply? [3]

**Q. 30)** What is meant by “Economic Growth”? What are the key factors that may lead to Economic Growth? [4]

**Q. 31)** With the use of a Phillips curve diagram, illustrate how a reduction in the rate of growth of money supply may lead to a reduction in the rate of inflation. Use the labels LRPC and SRPC for long run and short run Phillips curves respectively. [4]

**Q. 32)** You are given the following data on India’s international transactions for the year 2007 with the rest of the world (ROW):

( 000 crs)	
Exports of goods and services	205
Imports of goods and services	175
Interest, Profits, Dividends received from ROW	30
Interest, Profits and Dividends paid to ROW	50
Unilateral receipts from ROW	40
Unilateral payments to ROW	60
Capital inflows from ROW	80
Capital inflows to ROW	40
Statistical error	?
Increase in official reserves	25

- (i) Calculate the current account balance indicating whether it is in surplus (+) or deficit (-). (1)
- (ii) Calculate the statistical error indicating whether it is positive (+) or negative (-). (1)
- (iii) State whether an increase in official reserves, all other things being equal, indicates that the Central Bank has been buying or selling (a) foreign currency (b) rupees, in the foreign exchange market. (1)
- (iv) State with reasons whether or not it is possible to calculate the trade balance amounts from the above set of figures. (1)
- [4]**

- Q. 33)** We know that the cross price elasticity of gadget prices on a specialized battery demand is  $-1.5$ . According to the advertisement for the gadget sale, the store is reducing the price on its gadget from INR 4000 to INR 3600. A quick phone call to the manager of Gadget store reveals that last week they sold 50 gadgets at INR 4000 per gadget. They currently also sell 100 batteries per week at a price of INR 40 per battery.
- (i) How might the store manager estimate what effect this sale will have on the demand for batteries? Based on your calculations, what will be the effect on the quantity of batteries sold? (2)
- (ii) We also know that the price elasticity of supply for batteries is 2.5. Given your answer in part (i), what will be the new price for batteries sold at the store? Use a diagram to help explain your answer. (3)  
[5]
- Q. 34)** (i) Define the “GNP deflator” including all symbols used. (1.5)
- (ii) In 1980, India’s nominal Gross Domestic Product (GDP) at market prices (measured in “current” i.e. 1980) was \$ 176bn. In 2006, India’s nominal Gross Domestic Product (GDP) at market prices (measured in “current” i.e. 2006) was \$ 814bn. Between 1980 and 2006, the GDP index deflator number increased from 100 to 295. What is India’s real economic growth during this period? (1.5)  
[3]
- Q. 35)** Consider the following situation. The small town of Vatican has two firms that cause air pollution: a plastic company and a transporting firm. The two firms currently throw 16 tons of pollutants into the air each year and the following table shows how much it would cost each firm to reduce its pollution.

Cost to reduce each ton of pollution

	PLASTIC CO.	TRANSPORTING CO.
1st Ton	1000	900
2nd	2000	1800
3rd	2200	2700
4th	2400	3600
5th	3000	4600
6th	3000	6000
7th	5000	12000
8th	20000	50000

(i) Now suppose that Vatican wants to eliminate 10 tons of air pollution. The first option Vatican considers is to make both firms eliminate 5 tons of pollution each. What is the cost of pollution elimination for each firm and the total combined cost for both firms (which represent the total cost for society)? (2)

(ii) Now suppose the town of Vatican knows the costs of pollution elimination for each firm as described in the table above. How much would the town make each firm eliminate their pollution to get the same amount of pollution reduction for less *combined* cost across the two firms? Explain why this solution is more efficient than the solution to part i.)? (2)

(iii) If instead, the town of Vatican decides to have an auction for "rights to pollute 1 ton" in order to reduce 10 tons of pollution, how many "rights to pollute 1 ton" would Vatican offer for sale?

How many rights would the plastic firm buy?  
How many rights would the transporting firm buy?

Which of methods (ii) and (iii) for reducing pollution is more efficient?  
Explain why. (4)  
[8]

**Q. 36)** In a famous quiz show, the contestants after clearing several rounds reach a level of INR 1 lac and are given an option of going further where they get 2 times their existing prize money (X) if they answer correctly and get an amount equal to X/A if they don't know the answer. Assume that there are 4 choices of answers to every question and the contest is at a stage where questions are so difficult that the contestants don't know any of the answers. The only way is to randomly guess the answers. All contestants have a utility function  $U(X)=X^{0.25}$

(i) Calculate the value of A so that the gamble is fair? (2)

(ii) Given the value of A as calculated above, would the contestants accept this gamble (3)

(iii) Suppose that the contestants have a lifeline 50:50 where they can choose to eliminate 2 choices. Would your answer to (ii) above change (2)  
[7]

**Q 37)** Discuss the effectiveness of monetary and fiscal policy with fixed and floating exchange rates. [10]

- Q 38)** Wheat, which is an important agricultural product for both India and other countries, has different demand and supply curves in different areas because of the difference of technology, location, weather, etc. Now assuming that the supply and demand curves in the Indian wheat industry are:

$$\text{Supply of wheat in India (Units: } 10^6 \text{ Kgs)} \quad Q_s = 0.3 * P$$

$$\text{Demand of wheat in India (Unit: } 10^6 \text{ Kgs)} \quad Q_d = 2 - 0.5P$$

As we can calculate from these two curves, the equilibrium price in the domestic market of India will be 2.5/Unit.

- (i) In 2008, the price of the world wheat market is 1.5. Assuming that there is no tariff, show the equilibrium of the wheat market in India.
- a) Draw the supply and demand curve in the Indian domestic wheat market. (2)
  - b) Calculate the consumer surplus and producer surplus in the market above and exhibit clearly within the diagram above. (2)
- (ii) In Jan. 2009, the Indian government got through a law issuing a tariff of wheat of 0.5/Kgs.
- a) Draw the new supply and demand curve in the graph. (1)
  - b) Recalculate the consumer surplus and producer surplus and exhibit clearly within the diagram above. (2)
  - c) Compare the sum of Consumer and Producer surplus in a. and b. Explain why there is some difference between them, if any with the help of a diagram. (3)

**[10]**

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