

# Actuarial Society of India

## EXAMINATIONS

16<sup>th</sup> May 2006

Subject CT7 – Economics

Time allowed: Three Hours (02.30 – 05.30 pm)

Total Marks: 100

### *INSTRUCTIONS TO THE CANDIDATES*

- 1) *Do not write your name anywhere on the answer scripts. You have only to write your Candidate's Number on each answer script.*
- 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) *For questions 1 to 26 which are multiple choice questions, there is only one alternative as the correct answer.*
- 5) *Fasten your answer sheets together in numerical order of questions. This, you may complete immediately after expiry of the examination time.*
- 6) *In addition to this paper you should have available graph paper, Actuarial Tables and an electronic calculator.*

#### **Professional Conduct:**

*"It is brought to your notice that in accordance with provisions contained in the Professional Conduct Standards, If any candidate is found copying or involved in any other form of malpractice, during or in connection with the examination, Disciplinary action will be taken against the candidate which may include expulsion or suspension from the membership of ASI."*

**Candidates are advised that a reasonable standard of handwriting legibility is expected by the examiners and that candidates may be penalized if undue effort is required by the examiners to interpret scripts.**

**AT THE END OF THE EXAMINATION**

**Hand in both your answer scripts and this question paper to the supervisor.**

- Q1)** If price of an input used by a monopolist rises, then, other factors remaining the same,
- (A) price charged by the monopolist will fall
  - (B) output produced by the monopolist will remain unchanged
  - (C) Output produced by the monopolist will rise
  - (D) Output produced by the monopolist will fall, but price charged by the monopolist will rise
- [1.5]**
- Q2)** Suppose an investment of Rs.1000 in an asset, X, yields a return of Rs.100 one year later, whereas investment of the same amount of money in another asset, Y, yields Rs.150 in one state of nature and Rs.50 in another state of nature. Each of these two states of nature is equally likely to occur. If the individual is indifferent between these two kinds of investments, then which of the following statements is true?
- (A) The individual is risk-averse
  - (B) The individual is risk-averse
  - (C) The individual is risk-neutral
  - (D) Nothing definite can be said about the individual's attitude towards risk
- [1.5]**
- Q3)** Suppose utility function of an individual derived from monetary pay-offs (denoted by X) is given by  $\log_e X$ . Then
- (A) The individual is risk-averse
  - (B) The individual is risk-lover
  - (C) The individual is risk-neutral
  - (D) Nothing definite can be said about the individual's attitude towards risk
- [1.5]**
- Q4)** If the ratio of marginal revenue to price is 1:2, then absolute value of elasticity of demand is equal to:
- (A) 1
  - (B) 0.5
  - (C) 2
  - (D) 0.2
- [1.5]**
- Q5)** In perfect competition, a firm is in equilibrium if
- (A) marginal cost is equal to price, but not to marginal revenue
  - (B) marginal cost is equal to marginal revenue, but not to price
  - (C) marginal cost is equal to average revenue, but not to marginal revenue
  - (D) marginal cost is equal to both price and marginal revenue
- [1.5]**
- Q6)** Which of the following events would shift the supply curve of good X to the right?
- (A) An increase in the price of good X
  - (B) An increase in the price of a substitute of good X
  - (C) A fall in the price of some input (required to produce good X)
  - (D) A decline in the price of a complementary of good X
- [1.5]**
- Q7)** Supply equation of a good X is  $X^s = 3 + 2P$ , where  $P$  = price of good X. If at  $P = \text{Rs.}6$ , there exists excess demand for good X, then which of the following is true?
- (A) Demand for good X at  $P = \text{Rs.}7$  is greater than 15

- (B) Demand for good X at  $P = \text{Rs.}5$  is greater than 15  
(C) Demand for good X at  $P = \text{Rs.}7$  is less than 15  
(D) None of the above [1.5]
- Q8)** In a two commodity world, the income-consumption path is found to be a straight line through the origin. It follows that  
(A) the income elasticity of demand for each commodity is one  
(B) the sum of the income elasticities is one  
(C) income elasticity of every good is one if the income-consumption path has a slope of one  
(D) sum of the income elasticities of the two goods is one if the slope of the income-consumption path is unity [1.5]
- Q9)** In a two commodity world if a consumer is forced to spend her budget on 15 units of Good 1 and 12 units of Good 2 such the marginal rate of substitution of Good 1 for Good 2 at the purchased bundle is found to be greater than  $(P_1 / P_2)$ . If allowed a free choice the consumer would have  
(A) bought more of Good 1 and less of Good 2  
(B) bought more of Good 2 and less of Good 1  
(C) bought more of Good 1 and less of Good 2 if the indifference curves were flatter than the budget line  
(D) None of the above [1.5]
- Q10)** The law of downward-sloping demand can be explained in terms of  
(A) the substitution effect  
(B) the income effect  
(C) neither the substitution nor income effect  
(D) both the substitution and income effects. [1.5]
- Q11)** In a two commodity world if the consumer spends her entire budget on Good X (Good Y), she can buy 10 units of Good X (20 units of Good Y). Then the location of the commodity bundle (Good X = 1 unit, Good Y = 16 units)  
(A) is on the budget line  
(B) is above the budget line  
(C) is below the budget line  
(D) cannot be determined, given the information provided [1.5]
- Q12)** In a perfectly competitive industry, long-run equilibrium of a firm is a situation where  
(A) price equals average cost and not marginal cost  
(B) price equals marginal cost and not average cost  
(C) price equals both average and marginal costs  
(D) price equals marginal cost, but is above the average cost [1.5]
- Q13)** Suppose that in a two commodity world, prices of the commodities as well as the budget of the consumer double. Following this  
(A) the consumer can no longer afford to buy the commodity bundle (10, 12), which she could buy before the change  
(B) the consumer can afford to buy the commodity bundle (7, 15), which she could not buy before the change  
(C) Even after the change the consumer can afford to buy the bundle (5, 16), which she could buy before the change  
(D) Information provided is inadequate to arrive at any conclusion [1.5]

- Q14)** A perfectly competitive firm
- (A) cannot earn supernormal profit in the short-run since price equals marginal cost in equilibrium
  - (B) cannot earn supernormal profit in the long-run because of the assumption of free entry
  - (C) cannot earn supernormal profit in the short-run because price equals average cost in equilibrium
  - (D) can earn supernormal profit in the long-run, but not in the short-run as in the former all inputs are variable, but in the latter some inputs are fixed [1.5]
- Q15)** A change in the money supply in the IS-LM model is found to increase the equilibrium level of GDP. This implies that
- (A) there has been an accompanying decrease in the interest rate
  - (B) there has been an accompanying increase in the interest rate
  - (C) the IS curve has shifted to the right
  - (D) investment has gone up [1.5]
- Q16)** An increase in the absolute value of interest rate-sensitivity of investment demand
- (A) reduces the slope of the LM curve
  - (B) reduces the absolute value of the slope of the IS curve
  - (C) increases the absolute value of the slope of the IS curve
  - (D) increases the slope of the LM curve [1.5]
- Q17)** A deficit or surplus in a nation's balance of payments is measured by subtracting all the debits from all the credits in the
- (A) current account
  - (B) current and capital accounts
  - (C) current, capital and official reserve accounts
  - (D) capital and official reserve accounts [1.5]
- Q18)** Which of the following is not included in the current account section of the balance of payments?
- (A) Government grants
  - (B) Capital inflows
  - (C) The export of goods and services.
  - (D) The import of goods and services. [1.5]
- Q19)** Which of the following statements is true?
- (A) Exports lower aggregate spending on domestically produced goods and services.
  - (B) An increase in net export lowers aggregate spending on domestically produced goods and services.
  - (C) Imports lower aggregate spending on domestically produced goods and services.
  - (D) Imports and exports have no effect upon aggregate spending on domestically produced goods and services [1.5]
- Q20)** In the IS-LM model the level of private investment can be kept unchanged following an increase in government expenditure
- (A) if there takes place an increase in money supply in appropriate quantity

- (B) if there takes place a reduction in money supply in appropriate quantity  
(C) even if there is no change in money supply  
(D) if there takes place an increase in money supply in appropriate quantity and interest elasticity of investment is sufficiently high [1.5]
- Q21)** In the simple Keynesian model for an open economy (where imports are a function of income and exports are exogenously given), an increase in the income tax rate will  
(A) increase the total import bill  
(B) improve the trade balance  
(C) leave the total import bill unchanged  
(D) may improve the trade balance [1.5]
- Q22)** Pension received by a retired person is  
(A) a part of national income  
(B) a part of GDP  
(C) a part of personal disposable income  
(D) a part of personal income but not of personal disposable income [1.5]
- Q23)** In national income accounting a ceteris paribus increase in indirect taxes accompanied by an equal amount of reduction in personal tax will  
(A) reduce national income and raise personal disposable income  
(B) will keep both personal income and personal disposable incomes unchanged  
(C) have no impact on national income and personal disposable income  
(D) reduce national income and keep personal disposable income unchanged [1.5]
- Q24)** A discriminating monopolist allocates her output across different markets in such a manner that  
(A) own price elasticity of demand is the same in every market  
(B) marginal revenue is the same in every market  
(C) profit is maximized in every market  
(D) average revenues are the same in every market [1.5]
- Q25)** The Phillips curve shows that  
(A) high unemployment rates are associated with low inflation rates  
(B) high unemployment rates are associated with high inflation rates  
(C) high unemployment rates are associated with a large increase in the nominal wage  
(D) high unemployment rates are associated with a small increase in the nominal wage. [1.5]
- Q26)** Following a balanced budget increase in the government expenditure and tax, the aggregate demand curve in the (Y,P) plane  
(A) will shift to the right by an amount less than the increase in G  
(B) will shift to the right by an amount greater than the increase in G  
(C) will shift to the right by an amount equal to the increase in G  
(D) will not shift at all [1.5]
- Q27)** Consumption (C) and investment (I) functions in a closed economy without government are given by  $C = 100 + 0.7Y$  and  $I = 200 + 0.1Y$ .  
(i) Calculate the equilibrium level of saving. (2)  
(ii) If autonomous component of consumption declines by 20 units, what happens to autonomous component of saving? (1)

- (iii) What happens to the equilibrium level of saving following the change in the autonomous component of saving referred to in (ii)? Is the result paradoxical? Explain in one **sentence or two**. (3)  
[6]
- Q28)** Which of the following statements are attributable to monetarism and which are not? (1)  
 (A) Money demand function is unstable (1)  
 (B) Changes in money supply are the major cause of fluctuations in output and employment in the short run (1)  
 (C) Government should resort to measures such as tax cut to fight recession (1)  
 (D) Money supply is endogenously determined (1)  
[4]
- Q29)** Consider a perfectly competitive market for a commodity. Suppose that the market demand and supply curves of the commodity in the short run are given by  $D = 200 - 0.25P$  and  $S = -10 + 0.5P$ . There are 100 identical firms operating in the market in the short run. (1)  
 (i) How much output does each firm produce in equilibrium? (1)  
 (ii) What are the marginal cost and marginal revenue of each firm in equilibrium? (1)  
 (iii) By how much will the equilibrium level of output of each firm change, if autonomous component of demand falls by 30 units? Explain and illustrate graphically. (3)  
[5]
- Q30)** Market demand function of a commodity is given by  $Q = 200 - 0.25P$ . Suppose that there is just one firm catering to this market. Its cost function is given by  $C = 100 + 8Q + 2Q^2$ . The firm is a profit maximiser. (3)  
 (i) How much output (Q) will the firm produce? (1)  
 (ii) What price (P) will it charge? (1)  
 (iii) How much profit will it make? (1)  
[5]
- Q31)** A monopolist manufacturer has succeeded in segregating the buyers of her product into two separate groups: the rich and the poor. Their demand functions are given by  $Q^R = P^{-2}$  and  $Q^P = P^{-3}$  respectively. The monopolist is a profit maximiser. (3)  
 (i) Whom will the manufacturer charge more? (3)  
 (ii) By how many percentage points will the price faced by the group paying the higher price exceed that faced by the other group?  
 Also suppose that the cost of production of the manufacturer is  $C = \frac{1}{2}Q$  (where  $Q = Q^R + Q^P$ ). (3)  
 (iii) How much output will she produce? (3)  
 (iv) Why does she charge different prices to two groups of buyers? Explain. (4)  
[13]
- Q32)** Consider a simple Keynesian model where consumption (C) and investment (I) functions are respectively given by  $C = 100 + .75Y$  and  $I = 50$ . C, I and Y are measured in rupees. (1)  
 (i) What is the amount of involuntary change in inventory at  $Y = 500$ ? (1)  
 (ii) What is the level of planned saving at  $Y = 500$ ? (1)  
 (iii) Are actual saving and actual investment equal at  $Y = 500$ ? (3)  
[5]

- Q33)** Consider the following data of an economy of a given year. All data are in rupees. GDP = 1000, GNP = 1200, personal disposable income = 1000, personal saving = 200, investment = 80, undistributed profit of corporations = 0, net foreign transfers = 0 and government expenditure = 20.
- Find out the values of net factor income from abroad, aggregate consumption expenditure, total taxes net of transfers and trade balance. [4]
- Q34)** How are output and rate of inflation affected in the short and in the long run, if the central bank raises the rate of growth of money supply permanently? Explain your answer using a diagram. [8]
- Q35)** State true or false with reason
- (i) A tax on petrol is regressive. (2)
- (ii) A tax on gifts and bequests given by individuals is an indirect tax (2)
- [4]
- Q36)** An individual having a wealth of Rs.100 has the option of buying a lottery ticket, which costs Rs.5. The chance of her winning the lottery is .01, in which case she will get a prize money of Rs.500. Her utility function is given by  $U = U(W); U' > 0, U'' < 0$
- A)** (i) What is her expected wealth, if she buys the lottery ticket? (2.5)
- (ii) Will she buy the lottery ticket? Explain (2.5)
- B)** An individual with a wealth of Rs.35,000 faces a one percent probability of losing Rs.10,000 and she decides to insure half of the loss at a risk premium of Rs. 250. What is her expected wealth? (2)
- [7]

\*\*\*\*\*