

Actuarial Society of India

EXAMINATIONS

15th November 2005

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.

- Q.1)** Consumer always purchases two goods X and Y. If the price of X falls and the absolute value of the substitution effect on the quantity of X consumed is greater than the absolute value of the income effect, then
- (A) X is not a Giffen good
 - (B) X is an inferior good
 - (C) Y is a normal good
 - (D) X is a normal good
- [1.5]**
- Q.2)** A firm produces output using labour and capital. If prices of both inputs double, then the total minimum cost of producing any given level of output is
- (A) necessarily doubled
 - (B) necessarily less than doubled
 - (C) necessarily more than doubled
 - (D) doubled provided the firm has constant returns to scale technology
- [1.5]**
- Q.3)** In which of the following cases will the budget line move upward without changing its slope
- (A) price of good 1 increases by 5%, while the price of good 2 decreases by 5%
 - (B) prices of goods 1 and 2 increase by 5%
 - (C) prices of goods 1 and 2 decrease by 5%, while money income decreases by 2.5%
 - (D) prices of goods 1 and 2 increase by 10%, while money income increases by 5%
- [1.5]**
- Q.4)** The profit maximizing output of a monopoly firm corresponds to
- (A) Elastic segment of its AR
 - (B) Inelastic segment of its AR
 - (C) The mid point of its AR
 - (D) Both B and C .
- [1.5]**
- Q.5)** An individual is facing a gamble. The certainty equivalent of the gamble is found to be less than the expected value of the pay-off from the gamble, then the individual
- (A) is a risk averter
 - (B) is a risk lover
 - (C) is risk neutral
 - (D) is either risk neutral or a risk averter
- [1.5]**
- Q.6)** A risk averter's utility function over money pay-offs is
- (A) strictly concave
 - (B) strictly convex
 - (C) straight line
 - (D) horizontal
- [1.5]**

- Q.7)** If an increase in price causes total expenditure on the commodity to fall, which one of the following can be inferred?
- (A) demand is elastic
 - (B) demand is inelastic
 - (C) demand is perfectly inelastic
 - (D) demand is unitary elastic
- [1.5]**
- Q.8)** If the demand curve for a good is a vertical straight line, the elasticity would be
- (A) zero
 - (B) one
 - (C) infinity
 - (D) minus infinity
- [1.5]**
- Q.9)** Which one of the following elasticities measures a movement along a curve?
- (A) the price elasticity of demand
 - (B) the income elasticity of demand
 - (C) the cross price elasticity of demand
 - (D) none of the above
- [1.5]**
- Q.10)** If the demand curve for apples (a normal good) shifts to the left, this could be due to
- (A) an increase in the price of apples
 - (B) an increase in consumer's income
 - (C) an increase in the prices of other fruits
 - (D) a shift in tastes and preferences to other fruits
- [1.5]**
- Q.11)** In oligopoly, the kink on the demand curve is more due to
- (A) Non-fulfilment of the assumption that a price increased by a firm is not matched by others
 - (B) Fulfilment of the assumptions that a price cut made by a firm is matched by others and a price increased by a firm is not matched by others
 - (C) Discontinuity in MR.
 - (D) Discontinuity in AR
- [1.5]**
- Q.12)**
- Suppose the production function of a firm involving two inputs and a single output shows increasing returns to scale. The firm produces a given quantity of the output using given quantities of the two inputs. If the quantities of the two inputs are halved, then which of the following is true?
- (A) Output produced is exactly halved;
 - (B) Output produced falls below half of its initial level
 - (C) Output produced falls, but remains above half of its initial level
 - (D) It cannot be predicted without knowing the exact form of the production function.
- [1.5]**
- Q.13)** Tax structure is progressive if
- (A) the rich pay a smaller proportion of their income as tax.
 - (B) the rich pay a larger proportion of their income as tax.
 - (C) the rich and the poor pay the same proportion of their incomes as tax, but the former pay a larger absolute amount of tax.
 - (D) post-tax incomes of both the rich and the poor are the same.
- [1.5]**

- Q.14)** During a period net loan from abroad of an economy is positive. This necessarily implies that during the given period
- (A) trade balance is negative
 - (B) net factor income from abroad is negative
 - (C) current account balance is negative
 - (D) change in foreign exchange reserve is positive
- [1.5]
- Q.15)** Which of the following statements is **false**?
- (A) Pension payment to a disabled soldier is not a part of GDP.
 - (B) Pension payment to a disabled soldier is not a part of government consumption expenditure.
 - (C) Pension payment to a disabled soldier is not a part of national income.
 - (D) Pension payment to a disabled soldier is not a part of personal income.
- [1.5]
- Q.16)** (This is a question on national income accounting). In an economy in a certain year production of capital goods is found to be higher than that of the previous year by 100 units of which only 80 units can be sold in the market. In the same year import of capital goods falls by 30 units, while everything else remains unchanged. Therefore
- (A) GDP in the given year is larger than that of the previous year by 80 units.
 - (B) GDP in the given year is larger than that of the previous year by 130 units.
 - (C) GDP in the given year is larger than that of the previous year by 70 units.
 - (D) GDP in the given year is larger than that of the previous year by 100 units.
- [1.5]
- Q.17)** Which of the following transactions is **not** included in GDP?
- (A) Mr. A pays tuition fee to the private tutor of his son
 - (B) Mr. A buys a new car.
 - (C) Mr. A pays air fare for a trip from Calcutta to Delhi to attend Diwali celebration
 - (D) Mr. A buys 100 shares of Reliance Infocom.
- [1.5]
- Q.18)** Consider a simple Keynesian economy in which the government expenditure, G , equals total tax revenue tY , where t denotes the tax rate and Y denotes GDP. Suppose that the government raises t , then
- (A) Y will increase
 - (B) Y will decrease
 - (C) Y remains unchanged
 - (D) Y may change in either direction
- [1.5]
- Q.19)** If demand function for money is $L = kY - hr$ (where $k > 0$, $h > 0$, Y is income and r is rate of interest), an increase in the autonomous money supply by ΔM , ceteris paribus, will shift the LM curve
- (A) rightward by $\frac{\Delta M}{h}$.
 - (B) leftward by $\frac{\Delta M}{h}$.

- (C) rightward by $\frac{\Delta M}{k}$.
- (D) leftward by $\frac{\Delta M}{k}$.

[1.5]

Q.20) Which of the following should decrease the money supply?

- (A) RBI buys government bonds from the market.
- (B) RBI sends a circular to all major banks to reduce their cash reserve ratio.
- (C) RBI sells government bonds in the market.
- (D) Through the voluntary disclosure scheme the government extracts from the private sector an additional tax revenue of Rs. 5000 crore.

[1.5]

Q.21) If LM curve is vertical, other factors remaining the same, an increase in government expenditure will result in

- (A) no change in income(Y).
- (B) small increase in Y.
- (C) infinite increase in Y.
- (D) large increase in Y.

[1.5]

Q.22) Which one of the following represents high powered money ?

- (A) $M1+DD$ (Demand Deposits)
- (B) $M2+DD$
- (C) $M3+DD$
- (D) Currency+Reserves.

[1.5]

Q.23) If rupee shows a tendency to depreciate vis-à-vis dollar, then to prevent this depreciation the RBI should

- (A) sell rupee and buy dollar.
- (B) buy rupee and sell dollar.
- (C) reduce the rate of interest.
- (D) raise the rate of interest.

[1.5]

Q.24) The value of the multiplier in an open economy relative to that in a closed economy, when both have same spending propensities,

- (A) is higher
- (B) is smaller
- (C) is the same
- (D) is ambiguous.

[1.5]

Q.25) Anticipated inflation in the long run leads to

- (A) an increase in the real rate of interest.
- (B) an increase in the nominal rate of interest.
- (C) a decrease in the nominal rate of interest.
- (D) a decrease in the real rate of interest.

[1.5]

- Q.26)** Net indirect taxes refer to difference between
 (A) gross taxes and depreciation
 (B) indirect taxes and subsidies
 (C) indirect taxes and surcharge
 (D) indirect taxes and collection expenses.

[1.5]

- Q.27)** An individual's utility function over money pay-off, W , is of the form $U(W) = W^{\frac{1}{2}}$. He is offered a choice between a gamble that pays Rs.900 with probability $\frac{1}{4}$ and Rs.100 with probability $(\frac{3}{4})$, and a certain payment of Rs.300.

- (i) Which one would he choose? (4)
 (ii) What if the certain offer is changed to
 (a) Rs.225, (3)
 (b) greater than Rs.225 and less than Rs.300, (1)
 (c) Rs.224 (1)

Total [9]

- Q.28)** Indicate which of the following assumptions support monetarist conclusions and which of them yield Keynesian results:

- (A) LM schedule is very steep or vertical. (1)
 (B) LM schedule is very flat or horizontal. (1)
 (C) IS curve is vertical. (1)
 (D) Money demand is interest insensitive and so is money supply. (1)

Total [4]

- Q.29)** In a perfectly competitive industry, market demand curve is given by $Q^D = 100 - 5P$. There are 100 identical firms in the industry each having the cost function $C = 100 + .8q + 2q^2$. Derive the firm's supply curve, industry supply curve and hence the equilibrium price and quantity that prevail in the industry in the short run.

Total [5]

- Q.30)** The following information are given about the technology used by a perfectly competitive firm

Number of employees per week(L)	Output produced per week(q)
1	22
2	34
3	44
4	51
5	56
6	59

Construct a table to provide the following information

- (i) marginal product of labour(mpl) at each level of L (1)
- (ii) marginal value product of labour at each level of L given that output price, P, is Rs.2. (1)
- (iii) Suppose money wage rate, W, is Rs.14 and price of output, P, is Rs.2. Find out the profit maximizing level of output and employment of the firm. (1)
- (iv) How does the answer to (iii) change if W rises to Rs 45. (2)

Total [5]

Q.31) Consumption and investment function in a closed economy without government are given respectively by $C = 100 + .7Y$ and $I = 200 + .1Y$.

- (i) Calculate the equilibrium level of income. (1)
- (ii) Calculate the unplanned inventory accumulation when $Y=1200$. (2)
- (iii) Compute the change in aggregate planned investment if the autonomous part of aggregate planned investment rises by 50 units (2)

Total [5]

Q.32) Consider the following data of an economy in any given period

	Crores of rupees
New buildings produced	5
New equipments produced	10
Consumer goods produced	90
Estimated depreciation of existing buildings	10
Estimated depreciation of existing equipments	10
Inventory of consumer goods at the beginning of the year	50
Inventory of consumer goods at the end of the year	30
Consumer goods consumed	110

- (i) Compute GDP and break it up into C and gross I (1+1)
- (ii) Compute NDP and break up NDP into C and net I (1+1)

Total [4]

Q.33) Suppose that in a simple Keynesian model for a closed economy without government $I = 200$ and $C = a + bY$; $a > 0$ and $0 < b < 1$. When $Y = 0$, C is found to be (1/2) of aggregate planned demand. Again, when $Y = 1000$, producers sell 200 units from stock to meet aggregate planned demand.

- (i) What is the value of 'a' in the consumption function? (2)
- (ii) What is the value of aggregate demand, when $Y = 1000$? (1)
- (iii) What is the size of the autonomous expenditure multiplier? (2)

Total [5]

Q.34) If other firms in an oligopolistic industry do not respond to changes in the price of a firm's product, the demand curve is $Q = 60 - P$. However, if other firms always match the firm's price, the demand

$$\text{curve is } Q' = \frac{80}{3} - \frac{P}{3}.$$

The firm's total cost function is:

$$TC = 100 + 20Q + 0.5Q^2.$$

Where P is price (in rupees), Q is output (in thousands), and TC is total cost in thousands of rupees.

- a) Determine the price and output at the kink on the demand curve. (3)
- b) Calculate price, output, and profits at the profit maximizing activity level. (5)
- c) How much marginal costs rise before the optimal price would increase? How much could they fall before the optimal price would decrease? (2)

Total [10]

Q.35) Write down the equation of the Phillips curve. Why is the Phillips curve downward sloping in the short run? What does it imply? Why is it vertical in the long run? What is its significance? Why does fiscal policy affect output and employment only in the short run and not in the long run? (1+1+1+1+1+5)

Total [10]

Q.36) Indicate with reasons whether the following statements are true or false

- (A) Customs duties on imported products are direct taxes. (1)
- (B) Taxes on income are indirect taxes. (1)
- (C) Sales taxes on sports cars are regressive. (1)
- (D) Sales taxes on kerosene are progressive. (1)

Total [4]
