

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

3rd November 2008

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)** Marginal utility is a measure:
- A. of the total utility derived from consuming marginally beneficial goods.
 - B. of the additional utility derived through the consumption of an additional unit of a good.
 - C. computed by dividing total utility by the number of units of a good consumed.
 - D. determined strictly by interactions of supply and demand.
 - E. none of the above.
- [1.5]**
- Q. 2)** If total utility is increasing, marginal utility:
- A. must be increasing.
 - B. must be decreasing.
 - C. may either be increasing or decreasing, although it must be greater than zero.
 - D. must be increasing at an increasing rate.
 - E. none of the above.
- [1.5]**
- Q. 3)** In a competitive market, diminishing marginal utility implies that:
- A. the first units bought will contribute the most to consumer surplus.
 - B. the last units bought will contribute the most to consumer surplus.
 - C. the higher the price, the greater will be the consumer surplus, all else equal.
 - D. each unit bought will contribute an equal amount to consumer surplus.
 - E. nothing, since consumer surplus and marginal utility are totally unrelated.
- [1.5]**
- Q. 4)** Which of the following seems a contradiction to the law of diminishing marginal utility?
- A. Anuj enjoys his 20th beer of the evening more than his first.
 - B. Kush finds that the effort associated with preparing for a date exceeds the enjoyment gained.
 - C. Howard has a decreasing desire for more wealth the richer he becomes.
 - D. Mr. Hyundai must work increasingly hard to make extra cars as he attempts to exceed his production quota.
 - E. None of the above
- [1.5]**
- Q. 5)** If it is observed that, in a particular market, price has risen and quantity exchanged has increased, it is likely that:
- A. supply has increased.
 - B. supply has decreased.
 - C. demand has increased.
 - D. demand has decreased.
- [1.5]**

- Q. 6)** The quantity demanded will equal the quantity supplied at a free market equilibrium and also when:
- A. a price floor is established above the equilibrium price.
 - B. suppliers are able to sell their commodity for the black market price.
 - C. a price ceiling is established below the equilibrium price.
 - D. an effective price ceiling exists and the government is able to prevent the development of a black market.
 - E. none of the above cause quantity demanded to equal quantity supplied. **[1.5]**
- Q. 7)** If, in response to a price ceiling, a black market develops that gains control of all of the supply of the commodity, all of the following will be true except:
- A. the black market price will be higher than the ceiling price.
 - B. excess profits will go to the black marketeers.
 - C. quantity demanded will exceed quantity exchanged at the black market price.
 - D. the black market price will be higher than the equilibrium price.
 - E. all of the above are true. **[1.5]**
- Q. 8)** When the actual price of a good is above its equilibrium market price, competition among:
- A. buyers will force the actual price upward.
 - B. sellers will force the actual price upward.
 - C. sellers will force the actual price downward.
 - D. buyers will force the actual price downward.
 - E. none of the above. **[1.5]**
- Q. 9)** Suppose that the managers of a dance-teaching academy propose that the admission fee be increased as a means of raising additional funds to support more such academies. The managers are implicitly assuming that the price elasticity of demand for a ticket is:
- A. less than unity
 - B. greater than unity
 - C. unity
 - D. it really says nothing about price elasticity **[1.5]**
- Q. 10)** Normal profits refers to:
- A. what all firms, on average, obtain as a return on investment.
 - B. the excess of revenue over full economic costs including imputed returns to capital and risk-taking.
 - C. the base used by the government to levy business taxes.
 - D. the level of profits necessary to ensure that the firm covers its day-to-day operating costs. **[1.5]**

- Q. 11)** A hotel resort in an exotic location with all the necessary infrastructure is experiencing a decline in the room occupancy, falling revenues, and inadequate profits. The average price of a room is \$200 and there are 2,500 rooms occupied on average at any time. The estimated price elasticity of demand is 1.5 and the resort is currently operating at an average of 75 percent of capacity. Which of the following methods is most likely to increase the resort's revenues and profits.
- A. a 10 percent increase in the average price of a room.
 - B. an aggressive advertising campaign.
 - C. a 10 percent increase in the average price of a room combined with an aggressive advertising campaign.
 - D. a 10 percent decrease in the average price of a room. [1.5]
- Q. 12)** A long-run demand curve, as compared to a short-run demand curve for the same commodity, is generally:
- A. more elastic
 - B. less elastic
 - C. of the same elasticity
 - D. steeper if the curves are plotted against the same horizontal scale.
 - E. none of the above. [1.5]
- Q. 13)** From which of the following data might you estimate a price elasticity of supply?
- A. a price hike from \$7 to \$13 causes sales to fall from 16,000 shirts to 8,000 shirts monthly.
 - B. farmers increase soybean plantings 15 percent when the price increases 5 percent.
 - C. the output of tennis balls slumps 8 percent when the prices of racquets go up 12 percent.
 - D. steel production and sales rise 18 percent when national income grows 13 percent. [1.5]
- Q. 14)** You know the following facts:
- a) the Rajasthan Royals have just won the first IPL series. Both Graeme Smith and Shane Watson using 'SS bats' have played magnificently. As a result, millions of young boys wish to emulate them.
 - b) 'VV bats' invests in new equipment that significantly increases labor productivity. What is the effect on Price and Quantity exchanged in the market for 'VV bats'?
- A. quantity exchanged would decrease and price would be indeterminate.
 - B. price and quantity exchanged would both decrease.
 - C. price would decrease and quantity exchanged would be indeterminate.
 - D. there is not enough information to determine either price or quantity. [1.5]

- Q. 15)** Which of the following government actions may not help to increase investment spending?
- A. Increasing Tax incentives
 - B. Making policy statements aimed at encouraging business confidence
 - C. Increasing its own capital expenditure
 - D. Increasing interest rates
- [1.5]**
- Q. 16)** At the natural level of unemployment, the long run Philips curve
- a. Slopes downwards
 - b. Slopes upwards
 - c. is vertical
 - d. is horizontal
- [1.5]**
- Q. 17)** For a Country C, the Public Sector Borrowing Requirement for the year 2006 was 400 Crores. The outstanding debt of public sector at the beginning of 2007 was 8000 Crores. The Public Sector Debt Repayment for the year 2007 was 300 Crores. The National Debt at the end of 2007 would be
- a. 7700 Crore
 - b. 8100 Crore
 - c. 8400 Crore
 - d. 8700 Crore
- [1.5]**
- Q. 18)** Which of the following is not an asset of a Bank
- a. deposits made with other bank
 - b. deposit account
 - c. loan advances
 - d. overdrafts granted to customers
- [1.5]**
- Q. 19)** The consumption function is given by $C = 40 + 0.8Y$. The taxation is 20% of income. Assuming all disposable income (Y_d) is either consumed or saved, the savings function is
- a. $S = -40 + 0.2 Y$
 - b. $S = -40 + 0.2 Y_d$
 - c. $S = -40$
 - d. $S = -40 + 0.36 Y_d$
- [1.5]**
- Q. 20)** Your investment consultant has advised you to invest in shares. You have opened a Demat account today with a bank. The bank has informed you that your account would be activated tomorrow. You are holding money to invest in shares once your account is activated. Under which of following Keynes's reasons for holding money, can your holding money be classified as

- a. The transactions motive
 - b. The precautionary motive
 - c. The asset motive
 - d. The speculative motive
- [1.5]

Q. 21) Which of the following actions of government would help increasing aggregate demand?

- a. Reduce import controls
- b. Reduce the money supply
- c. Reduce the value of currency
- d. Decrease the government spending

[1.5]

Q. 22) The population of a country is 100 Crores. 50 Crores of them are employed and 10 Crores are unemployed. What is the country's unemployment rate?

- a. 0.1
- b. 0.2
- c. 0.4
- d. 0.5

[1.5]

Q. 23) Which of the following is not true about fixed exchange rate?

- a. It gives greater certainty hence encourages foreign trade
- b. An independent monetary policy is possible
- c. Interest rates can not be allowed to rise
- d. Keynesian crowding out can't occur hence fiscal policy is more effective

[1.5]

Q. 24) If the marginal propensity to consume is lower and marginal propensity to import is higher, the multiplier effect is

- a. Higher
- b. Lower
- c. Remain same
- d. None of the above

[1.5]

Q. 25) Which of the following are transfer payments?

- I. Unemployment Benefit
- II. Interest on the national Debt
- III. Building hospitals

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

[1.5]

- Q. 26)** Which of the following will tend to make investment demand more volatile?
- I. an increase in the capital output ratio
 - II. an increase in the volatility of national income
 - III. an increase in the rate of depreciation
- A. I and II
 - B. II and III
 - C. I only
 - D. III only
- [1.5]**
- Q. 27)** What will be the effect of increasing the school leaving age on the Long run Aggregate Supply (LAS) curve?
- a. Does not change
 - b. Becomes horizontal
 - c. Shifts to the right
 - d. Shifts to the left
- [1.5]**
- Q. 28)** a) For expected utility theorem to hold true, state and briefly explain the commonly accepted axioms required (4)
- b) Consider 4 alternatives
- a₁ 1.00 chance of \$1,000,000
 - a₂ 0.10 chance of \$5,000,000, 0.89 chance of \$1,000,000, and 0.01 chance of \$0
 - a₃, 0.10 chance of \$5,000,000, 0.90 chance of \$0
 - a₄, 0.11 chance of \$1,000,000; 0.89 chance of \$0
- When a group of people were asked to chose their preferences between a₁ vs a₂ and a₃ vs a₄, a majority of them chose a₁ and a₃ respectively. Explain which of the axiom gets violated by these choices.
- [Hint: You may assume that preferring one option to other implies maximizing expected utility and not necessarily expected value] (5)
- c) List any two alternative decision rules that can be applied as compared to the expected utility theorem. (1)
- [10]**
- Q. 29)** Assume that the density function p_f for a randomly distributed variable {p_f(x) = P'_f(x)} is given by the following: p_f(x) = 3x² for 0 ≤ x ≤ 1 and 0 elsewhere. A second density function p_g for a randomly distributed variable {p_g(x) = P'_g(x)} is given by the following: p_g(x) = (2x³+x) for 0 ≤ x ≤ 1 and 0 elsewhere.
- a. Find P_f(x) and P_g(x). (2)
 - b. Demonstrate whether there exist conditions of First Order Stochastic Dominance. (2)
 - c. Demonstrate whether there exist conditions of Second Order Stochastic Dominance. (2)
- [6]**

Q. 30) Under the hammer :

Sealed-bid auction: Each bidder makes one bid, without knowing the others and the highest bid wins and the highest price paid.

Second price auction: Each bidder makes one bid, without knowing the others and the highest bidder wins but the second highest price is paid by the winner.

- a. Sealed bid auction: There are only 2 players bidding for telecom licenses in 4 areas viz. Delhi, Mumbai, Chennai and Kolkata. Following is the profit payoff matrix assuming no collusion and considering that the winning bidder gets one single license for all the 4 telecom circles specified

Profit Payoffs		Player 2 bid		
		Low	High	Very High
Player 1 bid	Low	(+100,+100)	(+0,+150)	(+0,+125)
	High	(+150,+0)	(+75,+75)	(+0, +50)
	Very High	(+125,+0)	(+50,+0)	(0,0)

What is the dominant equilibrium in the above pay off matrix?

What does this mean for the seller (government) and the bidders?

Comment on whether this is the most efficient form of auction and how can the second price auction be better in this case.

(4)

- b. Suppose, now the government is offering 4 licenses each, separately for different circles. The following payoffs can be presumed to represent one particular telecom circle revenue (and all four circles are also assumed to be equivalent), suggest a collusion strategy that the two players might enter into to maximize and equal their payoffs. Assume that perfect collusion is possible

Profit Payoffs for any one of the circles		Player 2 bid		
		Low	High	Very High
Player 1 bid	Low	(+25,+25)	(+0,+37.5)	(+0,+31.25)
	High	(+37.5,+0)	(+18.75,+18.75)	(+0, +12.5)
	Very High	(+31.25,+0)	(+12.5,+0)	(0,0)

(4)

[8]

- Q. 31)** With help of a diagram, explain how can a monopolist firm employ perfect price discrimination to increase its profits. [5]
- Q. 32)** Give a simple relationship between GDP at market prices and Net National Product at basic prices. [2.5]
- Q. 33)** Assuming aggregate demand is sufficient, list out 8 causes of unemployment. [3]
- Q. 34)** Country XYZ has a huge population and is 100% Agriculture based economy. The government wants to increase economic growth by increasing the quality of labour force and by increasing the input of land. Suggest how the government can do this. [3]
- Q. 35)** Government of a country ABC is worried about very high inflation and wants to control it through reducing money supply. List out and explain the ways by which the money supply can be reduced. Explain how each method help reducing money supply. [7]
- Q. 36)** Countries A and B have a total of 4000 hours each of labour available each day to produce Electric Bulbs and Head Phones. Both countries use equal number of hours on each good each day. Country A produces 800 Electric Bulbs and 500 Head Phones per day. Country B produces 500 Electric Bulbs and 250 Head Phones per day.
- In the absence of trade:
- i. Which country has absolute advantage in producing
 - a. Electric Bulbs
 - b. Head Phones(1)
 - ii. Which country has comparative advantage in producing
 - a) Electric Bulbs
 - b) Head Phones(2)
- Country A wanted to double the output hence doubled the labour hours. Country B conducted a training program to increase the efficiency which resulted into doubling the productivity of labour. But country B decided to keep the output same hence halved the hours of labour. And both countries are still using same number of hours for both goods.
- In this revised scenario, in the absence of trade:
- iii. Which country has absolute advantage in producing
 - a) Electric Bulbs
 - b) Head Phones(1)

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- iv. Which country has comparative advantage in producing
- a) Electric Bulbs (2)
 - b) Head Phones
- v. In order to specialize, both countries now transfer 400 hours of labour to that good where they have comparative advantage from the other good. Calculate the increase in productivity of both the goods due to this specialization. (3)
- vi. A student of the Economics made the following statement:
“Total production of goods will increase with specialization”.
Do you agree with the statement? Explain why with the help of your answer to ‘v’. (4)
- vii. Both countries have now, after specialization, decided to trade.
Country A decided to sell 100 Head Phones to Country B in exchange for 180 Electric Bulbs. Explain with calculations if this is beneficial to both countries. (2)
- [15]**
