

Answer all questions in the space provided on the exam.

Total of 80 points (and worth 45% of final grade).

Read each question carefully, so that you answer the question.

Short Answer (6 points each)

1. The September 11 2001 terrorist attacks have had a major impact on the U.S. airline industry. Airline travel is not as attractive to consumers due to longer check-in delays and personal safety concerns, while airline company costs have increased due to increased security.

(a) On an appropriate diagram indicate the impact of these changes on equilibrium prices and quantities in the airline travel market.

(b) On the same diagram show the change, if any, in total surplus.

(c) In response to the terrorist attack the U.S. congress approved \$10 billion in financial assistance to the airline industry. According to standard microeconomic analysis will this lead to a welfare gain to society? **Give a brief verbal explanation.**

2. A utility maximizing consumer chooses between consumption of videos and expenditure on all other goods. The price of videos **falls**. Indicate on an appropriate diagram:

(a) the substitution effect of the price decrease

(b) the income effect of the price decrease, and

(c) state **with an explanation** whether for the diagram you have drawn videos are a normal or inferior good.

3. Consider the following production function for the manufacture of tables:

$$Q = K^{0.25} L^{0.75}$$

where Q, K and L are respectively units of output, capital and labor.

At the moment $K = 625$ and $L = 10,000$, so $K^{0.25} = 5$, $L^{0.75} = 1000$, and $Q = 5,000$.

Labor costs \$100 per unit and capital costs \$300 per unit.

(a) Obtain the marginal product of labor at current K and L.

(b) Hence obtain the short-run marginal cost of producing a table, when only labor is free to vary in the short-run.

(c) The firm wishes to produce 5,000 tables. Is the current mix of capital and labor the optimal mix to do this in the long-run? **Explain your answer.**
(Hint: You will need to use some algebra).

4. Suppose the computer hard disk drive industry is a decreasing costs industry, with many firms each a small part of the market. Suppose that there is a large increase in demand for hard disk drives, due to increased demand for computers.

(a) On an appropriate diagram show the effect of the demand increase on output of individual hard disk drive manufacturers in the **short-run**.

(b) On an appropriate diagram show the effect of the demand increase on market equilibrium in the **long-run** in the market for hard disk drives.

(c) In a competitive industry with heterogeneous producers is the long-run industry supply curve likely to be upward-sloping or downward-sloping? **Explain your answer.**

5. Ian and Fiona are trading Pokemon and Digimon cards. For simplicity, assume that all Pokemon cards are viewed as identical and all Digimon cards are viewed as identical, though Pokemon cards are viewed as different from Digimon cards. Initially Ian has only Pokemon cards and Fiona has only Digimon cards.

(a) On an appropriate diagram (with Pokemon cards on the vertical axis) show the initial allocation of cards and the levels of happiness that Ian and Fiona receive.

(b) On the same diagram show a Pareto-efficient allocation of cards between Ian and Fiona. Your picture should make it clear that this is Pareto-efficient. [If you feel they cannot do better than the initial allocation then state this and explain].

(c) Give a verbal definition of Pareto efficiency.

6. In this question we consider the three necessary conditions for Pareto efficiency in an economy with production.

(a) Give the first condition and explain how this is satisfied under perfect competition.

(b) Give the second condition and explain how this is satisfied under perfect competition.

(c) Give the third condition and explain how this is satisfied under perfect competition.

7. Consider a monopoly producing pizzas in a small isolated community facing demand function: $P = 10 - 0.01Q$, where P is price of a pizza in dollars and Q is the number of pizzas. This implies the marginal revenue function $MR = 10 - 0.02Q$. There are no fixed costs of producing a pizza. The marginal cost is always \$2 per pizza.

(a) Calculate **both** the level of output **and** the level profit if the monopoly is a profit maximizer. [It may be helpful to also draw a diagram].

(b) Calculate **both** the level of output **and** the level of profit if the monopoly is a profit maximizer who can perfectly price discriminate. [It may be helpful to also draw a diagram].

(c) Calculate **both** the level of output **and** the level of profit if the monopoly is required to produce and sell at marginal cost.

8. Health researchers have discovered that drinking moderate amounts of red wine (one glass a day) is beneficial to the health due to the decreased risk of heart attack. Assume that this discovery is not widely known in the population. For simplicity assume that there are no other externalities in red wine production or consumption.

(a) On an appropriate diagram show the market equilibrium quantity of red wine consumed in the U.S.

(b) On the same diagram show the socially optimal amount of red wine for the U.S.

(c) The red wine lobby has calculated the health benefit of red wine in dollar terms to be one dollar per bottle. The lobby proposes that the government should subsidize wine production. The American Public Health Association instead proposes that the government should subsidize public service announcements publicizing the beneficial side-effects of red wine. Comment briefly on the pros and cons of these two responses.

9. Consider provision of hospital beds in a national health system, where hospitals are treated as a public good and are provided free to the public. The total cost of providing Q hospital beds is $\$500,000 \times Q$. For a city of one million people it has been calculated that the marginal benefit of the Q -th hospital bed is $\$(4,000,000 - 1,000 \times Q)$.

(a) On an appropriate diagram show the determinants of the provision of hospital beds in the city of one million people.

(Hint: Before proceeding think of the general model for provision of a public good).

(b) Hence calculate the equilibrium number of hospital beds for the city of one million people.

(c) Using standard economic theory, does the government need to treat hospital beds as a public good? **Explain your answer.**

Multiple Choice (2 points each)

1. The equivalent variation of a price increase in liquor due to an increase in tax on liquor is the amount of money needed to

- a. give initial utility at new price
- b. give initial utility at old price
- c. give new utility at new price
- d. give new utility at old price
- e. negate the deadweight loss of the tax.

2. Consider the following demand function: $x = 100 - 4p_x$. The price elasticity of demand when $p_x = 20$ is

- a. less than or equal to 0.5
- b. more than 0.5 and less than or equal to 1.0
- c. more than 1.0 and less than or equal to 2.0
- d. more than 2.0

3. If leisure is a normal good, then economic theory indicates that when the wage rate is increased

- a. income effect increases leisure and substitution effect decreases leisure
- b. income effect increases leisure and substitution effect increases leisure
- c. income effect decreases leisure and substitution effect decreases leisure
- d. income effect decreases leisure and substitution effect increases leisure

4. Bert is a price taking chimney sweep who receives \$100 per chimney sweep. His weekly total cost function is:

$$TC = 5Q^2 + 30Q + 60$$

where Q is the number of chimneys swept. The optimal number of chimneys swept per week is:

- a. 0
- b. between 0.1 and 5
- c. between 5.1 and 10
- d. between 10.1 and 15
- d. more than 15.

5. If the price of labor increases then in the long-run the demand for capital

- a. definitely increases
- b. definitely decreases
- c. possibly increases or decreases.

6. If Fred's marginal rate of substitution of carnations for roses is 2 and Norma's marginal rate of substitution of carnations for roses is 3 then we expect
- Fred to give up roses in return for carnations
 - Fred to give up carnations in return for roses
 - No trade between Fred and Norma.
7. The many theoretical attractions of perfect competition include:
- general equilibrium occurs in all markets
 - the allocation of goods is Pareto efficient
 - the allocation of goods is equitable
 - both a. and b.
 - all of a., b. and c.
8. Situations where monopoly is likely to arise are when
- the returns to scale are decreasing
 - there are legal barriers to entry
 - neither a. nor b.
 - both a. and b.
9. A profit-maximizing monopolist sells its output at price equal to
- $MC / (1 - 1/\epsilon)$ where ϵ is the price elasticity of demand
 - MC
 - $MC \times (1 - 1/\epsilon)$ where ϵ is the price elasticity of demand
 - none of the above.
10. Economists view externalities as a problem because they lead to
- Pareto inefficiency
 - A loss of total surplus
 - both a. and b
 - neither a. nor b.

11. The government creation of a market for pollution permits is an example of government response to externality by

- a.** assignment of property rights to the producer
- b.** assignment of property rights to those parties directly impacted by the externality
- c.** both a. and b.
- d.** neither a. nor b.

12. For a public good the marginal benefit of the good to society is

- a.** less than the sum of individual marginal benefits
- b.** equal to the sum of individual marginal benefits
- c.** greater than the sum of individual marginal benefits
- d.** unrelated to the sum of individual marginal benefits

13. Private provision of a good is least likely if it is

- a.** nonexcludable and nonrival in consumption
- b.** nonexcludable and rival in consumption
- c.** excludable and nonrival in consumption
- d.** excludable and rival in consumption