

Answer all questions in the space provided on the exam.

Total of 40 points (and worth 22.5% of final grade).

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

**Short Answer (6 points each)**

**1.(a)** On an appropriate diagram show the effect on consumer choice between goods consumption and leisure consumption of an increase in the wage rate. For your diagram state whether the consumer will work more or less.

**(b)** Suppose a consumer is a saver and interest rates increase. State (1) the substitution effect of the interest rate change on the amount saved; and (2) the income effect of the interest rate change on the amount saved.

**(c)** Explain opportunity cost in a general setting, giving an example.

2. 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 \$50 per unit and capital costs \$200 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).

3.(a) The AIDS epidemic has led to a reduction in the productivity of labor (relative to capital). On an appropriate diagram show the impact of this on the mix of capital and labor used in production.

**3.(b)** Give a verbal explanation for why a reduction of the price of capital will not necessarily lead to a decrease in the demand for labor.

**(c)** Suppose that for a firm capital and labor are perfect substitutes at all levels of output. What sort of production method do you expect the firm to employ? Explain your answer.

**4.(a)** On an appropriate diagram show the choice of output by a profit-maximizing price-taking firm.

**(b)** Explain why in the very long run an expansion in industry supply might occur even though price falls.

**(c)** Define increasing returns to scale and explain whether or not a perfectly competitive market is likely to arise if returns to scale are increasing.

5. Suppose the annual demand and supply of autos in California are given by:

$$\text{Demand: } P = 20 - 10Q$$

$$\text{Supply: } P = 10 + 10Q$$

where  $P$  is price of a car **in thousands of dollars** and  $Q$  is the quantity of cars **in millions**.

(a) Calculate the equilibrium price and quantity of cars.

You need to give answer in correct units: actual number of cars and in actual dollars.

(b) Calculate the total producers and consumers surplus.

Hint: A diagram will help. You need to give answer in correct units: actual dollars.

(c) On an appropriate diagram show the excess burden of a sales tax of \$2,000 per car, with statutory incidence on the seller. (There is no need to calculate the actual effect).

**Multiple Choice (2 points each)**

1. The Boeing Corporation calculates that it can sell 20 planes for \$20 million each or 30 planes for \$18 million dollars each. Then the marginal revenue from sale of a plane is
  - a. less than \$20 million
  - b. \$20 million
  - c. between \$20 million and \$30 million
  - d. \$30 million
  - e. more than \$30 million.
  
2. The demand for labor curve of a profit-maximizing price-taking firm is downward sloping because
  - a. the marginal product of labor is decreasing
  - b. the marginal factor cost of labor is decreasing
  - c. both a. and b.
  - d. neither a. nor b.
  
3. Suppose that a firm's total costs are given by  $TC = Q^3 - 4Q^2 + 9Q$ . Then its minimum average cost occurs when it produces:
  - a. 1 unit
  - b. 2 units
  - c. 3 units
  - d. 4 units
  - e. none of the above
  
4. In a perfectly competitive market in the long-run
  - a. Firms minimize cost per unit of output
  - b. Firms make zero economic profit
  - c. both a. and b.
  - d. neither a. nor b.
  
5. Suppose that complete deregulation of the California electricity market occurs, with the exception that the state government purchases the transmission lines for \$10 billion. It can either pay for this purchase by (1) a levy of 1 cent per kilowatt hour paid by the utilities when they purchase electricity from their energy producers, or (2) a levy of 1 cent per kilowatt hour paid by consumers. Assume utilities do not produce electricity, there is no transmission loss of electricity from producer to consumer. Then the market electricity price (including the levy) will be
  - a. higher under plan 1
  - b. higher under plan 2
  - c. the same under both plans.