UNIVERSITY OF CAMBRIDGE

ENGINEERING TRIPOS   PART IIA

Monday 2 May 2005   2:30 to 4

Module 3E1

BUSINESS ECONOMICS

Answer not more than two questions.

All questions carry the same number of marks.

*The **approximate** percentage of marks allocated to each part of a question is indicated in the right margin.*

There are no attachments.

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator

(TURN OVER

1   (a)   (i)   Explain the concept of the marginal rate of substitution between two goods.   [10%]

               (ii)   Is it possible for a consumer to maximise utility if the marginal rate of substitution is not equal the ratio of their prices?   [10%]

    (b)   To encourage energy conservation, utility companies charge consumers a higher rate on units of energy consumed in excess of some threshold amount. In contrast, a common marketing ploy by other firms is to offer "quantity discounts" to consumers who purchase large quantities of a good. To illustrate how these pricing schemes alter the typical consumer's opportunity set, suppose income = £100, P_x = £2 if the consumer buys less than 40 units of X, P_x = £3 if the consumer buys more than 40 units of X, and P_y = £5. Draw the budget constraint. How would the budget constraint change if the price decreased to £1 after 40 units of X were consumed?   [35%]

    (c)   Explain what would happen to the equilibrium consumption of two goods, X and Y, if:

               (i)   income doubled and all prices tripled,   [15%]

               (ii)   all prices doubled and income tripled,   [15%]

               (iii)   all prices and income doubled.   [15%]

2   (a)   Explain the concepts of marginal productivity of a factor of production, the technical rate of substitution, and the returns to scale with reference to the technology represented by $g(x,y) = x^{0.6} y^{0.7}$.   [40%]

    (b)   Suppose the production function of cars is given by $Q = K^{1/4} L^{3/4}$.

               (i)   Show that the marginal product of any given quantity of labour increases as capital is increased.   [20%]

               (ii)   Suppose Japanese and U.S. car manufacturers produce on identical isoquants with this Cobb-Douglas production function and that labour costs are higher in Japan than in the United States. Do car company workers in Japan have a higher marginal product than American car workers? Explain.   [20%]

               (iii)   Now suppose Japanese automakers produce on a different isoquant from U.S. firms, but the prices of Japanese and American cars are identical. Do Japanese or American autoworkers have a higher marginal product? Why?   [20%]

3   (a)   Would you expect the demand for a monopolistically competitive firm's product to be more or less elastic than that for a monopolist's product? Explain.   [20%]

(b)   Would collusion be more likely in the shoe industry or in the airline industry? Why?   [20%]

(c)   You are the manager of a firm in a new industry. You have secured a lead on the only other producer in the market. You know what your competitor's cost function is, and it knows yours. Your products are indistinguishable to the consumer. Your marketing research team has provided you with the following market demand curve: $Q = 1250 - 0.5P$. Your cost function is $C_A(Q_A) = 8Q_A$. Your competitor's cost function is $C_B(Q_B) = 6Q_B$. Your strategy will allow you to decide how much of your product to provide and allow you to place it on the market shortly before your competitor will be able to make its product available for sale. What output level will you choose, and what price will you charge? Explain.   [60%]

4   EITHER

(a)   (i)   Using an Edgeworth box diagram, explain what is meant by competitive general equilibrium.   [40%]

(ii)   Present and discuss an example of a situation in which a competitive general equilibrium is not the best economic outcome.   [60%]

OR

(b) Macroeconomic models determine output levels considering the commodities market, and the money market jointly. Examine the following simple macro economic model:

$C = 300 - 30r + 0.80Y_d$

$T = 100 + 0.25Y$

$I = 250 - 20r$

$G = 480$

$M_s = 475$

$M_d = 440 + 0.35Y - 70r$

Where C = Consumption, Y_d = Disposable Income, Y = Income, T = Tax revenue, I = investment, r = interest rate, G = Government expenditure, M_s = Money Supply, and M_d = Demand for Money.

(i)   Explain and determine the commodities market equilibrium?   [30%]

(ii)   Explain and determine the money market equilibrium?   [30%]

(iii)   What are the equilibrium levels of output, tax and budget deficit?   [40%]

END OF PAPER