UNIVERSITY OF CAMBRIDGE

ENGINEERING TRIPOS PART IIA

Monday 26 April 2004 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) "It is necessarily the case that average cost increases when marginal cost is greater than it, and decreases when marginal cost is less than it." Comment. [20%]

(b) Illustrate graphically how a firm that wants to produce a given level of output will choose its input of labour and capital,

(i) In the long-run;
(ii) In the short-run (when capital is fixed). [40%]

(c) Your firm produces two products, Q_1 and Q_2. An economic consulting firm has estimated your cost function to be $C(Q_1, Q_2) = 100 + Q_1Q_2 + Q_1^2 + Q_2^2$.

(i) Are there economies of scope?
(ii) Are there cost complementarities?
(iii) Your market for Q_1 is not very good, and an overseas firm has offered to buy the division of your company that produces Q_1. What will happen to your marginal cost (of producing Q_2) if you sell the division? [40%]

2 (a) "Consumer preferences can be represented by convex indifference curves." Discuss with reference to the concept of marginal rate of substitution. [25%]

(b) Explain the following terms:

(i) Income effect;
(ii) Substitution effect;
(iii) Price effect. [35%]

(c) If the income elasticity of demand for a good is negative, what might happen to the quantity demanded if the price of the good increases. Explain using a diagram. [40%]

3 (a) If you were the manager of a firm operating in a differentiated-product oligopoly, explain the nature of your optimal response (you may show this graphically) to an increase in your marginal cost if,

(i) You believe rivals will follow price reductions but not price increases;

(ii) You believe rivals will follow price increases but not price decreases. [40%]

(b) Suppose you are a paper clip manufacturer. Your company enjoys a patented technology that allows it to produce paper clips faster and at a lower cost than your only rival. You use this advantage to be the first to choose its profit-maximizing output level in the market. The inverse demand function for paper clips is $P = 500 - 2Q$, Your costs are $C_Y(Q_Y) = 2Q_Y$, and your rivals costs are $C_R(Q_R) = 4Q_R$.

(i) What is your profit-maximizing output level (in this Stackelberg setting) ?

(ii) What is the market's equilibrium price?

(iii) How much profit does each firm make?

(iv) Ignoring regulatory considerations, would it be profitable for your firm to merge with your rival (assuming the merged firm can use your patented technology)? [60%]

4 (a) "A competitive resource allocation may not be equitable, but it will be an improvement on the initial resource allocation." Comment. [40%]

(b) EITHER

"Pollution is harmful, and hence the Pareto-efficient level of pollution is zero." Comment.

OR

Using a non-cooperative game of your choice as an example, illustrate the conflict between individual and collective rationality. Can repetition of the game help achieve the collectively rational outcome? [60%]

END OF PAPER