UNIVERSITY OF LONDON   **279 0028 ZB**

BSc degrees and Diplomas for Graduates in Economics, Management, Finance and the Social Sciences, the Diploma in Economics and Access Route for Students in the External Programme

Managerial Economics

Friday, 2 June 2006 : 2.30pm to 5.30pm

Candidates should answer **SIX** of the following **TEN** questions: **FOUR** from Section A (12.5 marks each) and **TWO** from Section B (25 marks each). **Candidates are strongly advised to divide their time accordingly.**

A hand held calculator may be used when answering questions on this paper but it must not be pre-programmed or able to display graphics, text or algebraic equations. The make and type of machine must be stated clearly on the front cover of the answer book.

SECTION A

Answer all **four** questions from this section (12.5 marks each).

1. A monopsony faces the upward sloping labour supply $w(L) = 100+L$. The product price is fixed at $p=200$ and the production function is given by $y(L) = L$.

    (a) Find the profit maximising amount of labour to employ and the resulting wage and profit.

    (b) Assume now that the amount of labour the monopsonist is able to attract depends on the level of recruitment expenses R as well as the wage w as given by

    $$L(w, R) = -100 + w + R^{1/2}$$

    Determine the optimal wage and the optimal level of recruitment expenses and the corresponding amount of labour and profit.

2. Two construction firms are bidding for an infrastructure project. The probability that firm 1 wins the contract is given by $x_1 /(x_1 + x_2)$ where x_i represents bid preparation expenses of firm i $(i=1,2)$. The winning firm receives a gross profit P. Find the Nash equilibrium in expenses.

3. A consumer has utility function $U(x,y) = (x-\underline{x})(y-\underline{y})$. Find the demand functions.

4. Consider the following alternating offers bargaining game. Player 1 proposes a division of a cake of size 1 to player 2. Player 2 can either accept or reject. If he accepts, the proposed division is realised. If player 2 rejects, player 1 can once more propose a division for player 2 to accept or reject. If player 2 rejects this second offer he can propose a division to player 1 and player 1 can accept or reject. If player 1 rejects both players get nothing. After each rejection the cake shrinks to a fraction δ of its previous size. Find the perfect equilibrium.

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SECTION B

Answer **two** questions from this section (25 marks each).

5. An entrepreneur wants to pursue a project which has a payoff of R with probability p and 0 with probability $1-p$. The entrepreneur has no funds and needs to borrow an amount x to start the project. If the project is successful (i.e. the payoff is R) the bank will demand a payment of D $(D<R)$. If the project is unsuccessful, the bank cannot demand any payment.

  (a) Find the value of D which gives the bank zero expected profit.

  (b) Now suppose there are two entrepreneurs, each of whom has a project with the characteristics described above. The projects are independent. The bank offers the entrepreneurs a joint liability contract which involves each entrepreneur paying D if his project is successful and in addition an amount C if his project is successful and that of the other entrepreneur is not. Assume $D+C<R$. For which values of D and C does the bank make zero profits?

  (c) Find the values of D and C which maximise the expected payoffs to the entrepreneurs subject to the zero profit constraint identified in (b).

  (d) Assume $x=100$, $p=0.5$, $R=500$. Given your answer to (c) (i.e. assuming the bank makes zero expected profit and maximises expected entrepreneur payoff) what is the maximum value of D? What is the maximum value of C?

6. A monopoly has demand function $Q = 100 - p$ and marginal cost 50.

  (a) Find the profit maximising price and the resulting profit.

  (b) A regulator sets the price at 50 but the monopoly can make an investment to lower marginal cost. To reduce marginal cost to $50-s$ the monopoly has to spend $C(s) = as^2/2$. Find the optimal s.

  (c) Consider a two period version (without discounting) of (b). Suppose the monopoly has to charge a price of 50 in both periods but can reduce marginal costs in both periods i.e. $MC_1=50 - s_1$ and $MC_2=50 - s_1 - s_2$. As in (b) assume $C(s_i) = as_i^2/2$, $(i=1,2)$. Find the optimal s_1 and s_2.

  (d) Consider the two period model in (c) but now assume that the regulator sets the second period price equal to first period marginal cost i.e. $50 - s_1$. Find the optimal s_1 and s_2. Show that the optimal s_1 is lower than in (c) for $a>2$. Interpret this result.

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7. Consider a private value procurement auction with two bidders whose costs are uniformly distributed on $[0,1]$. The purchaser buys from the supplier who submits the lowest bid and pays the value of the bid.

   (a) Show that $b_i = (1+c_i)/2$, $i=1,2$ is a Nash equilibrium.

   (b) Assume there are n bidders. Show that $b_i = (1+(n-1)c_i)/n$, $i=1,...n$ is a Nash equilibrium.

   (c) Now assume a second price sealed bid auction i.e. the purchaser buys from the supplier who submits the lowest bid and pays the second lowest bid. How should the bidders bid in this setup?

8. Mr. Bun grows carrots for a living. He has recently discovered that there is a demand for the green stuff that grows on top of the carrots – spoilt pet bunnies adore it. Explain how you would advise Mr. Bun on the pricing of carrots and carrot tops.

9. (a) How should companies set their executives' pay?

   (b) A recent social network study of a large sample of directors analysed the impact of director relationships on the compensation of chief executive officers. CEOs who had a 'link' to someone on the company's compensation committee (e.g. they are both directors of another company) received on average $457K more than CEOs who had no such links. Discuss this finding.

10. (a) Explain the dominant firm model.

    (b) How would you modify this model to allow for a cartel of dominant firms?

END OF PAPER