

**This paper is not to be removed from the Examination Halls**

**UNIVERSITY OF LONDON**

**279 0078 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**

**Analysis of Strategic Management**

Friday, 26 May 2006 : 2.30pm to 5.30pm

Candidates should answer **SIX** of the following **NINE** questions: **FOUR** from Section A (10 marks each) and **TWO** from Section B (30 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.

PLEASE TURN OVER

## SECTION A

Answer all **four** questions from this section (10 marks each).

1. There are three statements below. You have to mention whether each statement is 'true' or 'false'. If true, give reasons why so (credit will be given for proofs). If false, either give a counter-example, or good reasons.

- (i) Every normal form game has a unique extensive form representation.
- (ii) In a matrix game suppose that a player's strategy  $\alpha$  strictly dominates strategy  $\beta$ , and moreover the player is indifferent between his strategies  $\beta$  and  $\gamma$  when the opponent plays  $\tau$ . Then  $\alpha$  gives a better payoff against  $\tau$  than  $\gamma$  does.
- (iii) Suppose a game has a Nash equilibrium where each player's strategy assigns positive probability to each pure strategy, then no player has a dominant strategy. (Assume each player has at least two non-equivalent strategies.)

2. For the 'Prisoner's Dilemma' type matrix game:

$$\begin{array}{cc} 7,7 & 0,10 \\ 10,0 & 1,1 \end{array}$$

explain why in an indefinitely repeating play of this game the co-operative outcome (7,7) can be supported by a Nash equilibrium pair of strategies provided the probability of continued play is large enough. How does this inspire an explanation for a co-ordinated equilibrium play of 'share the monopoly profits' in a market game in which there are exactly  $N$  firms, all similar.

3. In a three round alternating offers game the value to be divided between the two participating players is initially 200 dollars, falling after the first round to 100 dollars and then to 50 dollars in the last round. Before bidding begins the player who will be the first to bid makes a credible announcement that if he accepts below fifty-five per cent of the total available value in any round he will be obliged to pay forty-five per cent of the value accepted to another player. What amount does the second player accept in the first round? Explain your answer carefully.

4. Here is a model of value disclosure. You are asked in (i)-(iv) to analyse it.

Model: A chance move selects a number between 0 and 1 million dollars, each number being equally likely. This number will be the value of a firm's end of year profit. This means that if the profit is discovered to be in an interval like  $[0,t]$ , then the expected value of the profit is  $\frac{1}{2}t$ .

The Chief Executive of the firm has the opportunity to make a formal report to the shareholders. At that date he is known to have a 50% chance of discovering the true value  $X$  of the firm's end of year profit; if he reports the

(Question continues on next page)

discovered value, he will be believed. The manager is required to make his report only in such a way that the firm's value is maximized.

The Chief Executive may use the following strategy  $s(t)$  for some value  $t$ :

'Report the discovered value  $X$  if and only if  $X$  is above  $t$ ; otherwise do not report any value whatever'.

In this case the shareholders will value the firm according to the value reported, or, in the event of no value being reported, by reference to the expectation  $V(t)$ , where:

$$V(t) = \frac{1}{2} \cdot \frac{1}{1+t} + \frac{t}{1+t} \cdot \frac{t}{2} = \frac{1}{2} \cdot \frac{1+t^2}{1+t}$$

The Chief Executive thus values the firm as  $W(t)$ , where

$$W(t) = \frac{1}{2} \cdot \frac{1}{2} + \frac{1}{2} \cdot \left( V(t) \cdot t + \frac{1+t}{2} \cdot (1-t) \right) = \frac{1}{4} + \frac{1+2t-t^2}{4(1+t)}$$

(i) Suggest a justification for the two formulas.

*Hint: The event of no value being reported has probability  $\frac{1}{2} + \frac{1}{2}t$ , so the two cases of non-discovery, and of discovery of  $X$  below  $t$ , have the conditional probabilities:*

$$\frac{1}{1+t}, \quad \frac{t}{1+t}.$$

(ii) Check that the solution to the equation  $V(t) = t$  with  $t > 0$ , is  $t = \gamma$ , where  $\gamma = (\sqrt{2} - 1) = 0.414$ .

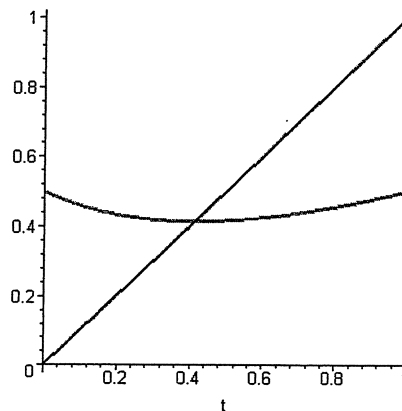
You are told this is also the location of the minimum value of  $V(t)$ , as illustrated in the figure below.

(iii) If the discovered value  $X$  is less than  $\gamma$ , why would disclosing the value  $X$  be a dominated strategy?

(iv) Deduce that the manager should follow strategy  $s(\gamma)$ .

*Hint: You may use the identity*

$$W(t) = \frac{3}{4} - \frac{1+t^2}{4(1+t)} = \frac{3}{4} - \frac{1}{2}V(t).$$



For Question 4: Graph of  $V(t)$  and  $t$  against  $t$ .

## SECTION B

Answer any **two** questions from this section (30 marks each).

5. (*Pricing and Positioning*) ‘Successful companies must strive for stable competitive environments’. Describe conditions that are conducive and those that are resistant to the achievement of this aim. Does instability of competition inevitably bid prices down to cost?
6. (*Reputation*) Describe the significant mechanisms by means of which a firm can build, spread and maintain reputation.
7. (*Innovation*) According to John Kay innovation is a ‘primary distinctive capability’. Discuss how a firm might attempt to (i) acquire this capability, (ii) protect and exploit it?
8. (*Appropriability*) The number of successful animated movie characters has greatly expanded over the decades since Mickey Mouse and Donald Duck to now include such names as Nemo. Examine the link between appropriability and product differentiation.
9. (*First mover advantage*) The year is 1980. Minnetonka Corporation is a firm which plans the innovative move of introducing liquid soap for hand-washing (dispensed from a bottle). You are a management consultant advising the firm; what do you suggest the firm should do to build and hold onto market share in the face of possible later competition from imitations by the established firms in the soap and detergent industry. If instead you were advising an established soap and detergent manufacturer who discovers that such an innovation is about to be launched, what advice would you give them at such a time in regard to preserving their hold of the hand soap market and also the possible exploitation of this innovation.

END OF PAPER