THE UNIVERSITY OF MELBOURNE

MELBOURNE BUSINESS SCHOOL

Managerial Economics

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Final Exam: Semester 1, 1998
Reading Time: 15 minutes
Exam Duration: 120 minutes

THIS IS AN OPEN BOOK EXAMINATION

1. During the reading time candidates may make notes on the exam paper but may not write in their script books.

2. Simple calculators can be used.

3. Answer Parts A and B and follow the instructions for each carefully.

4. Answer all questions in the answer book provided.

5. The total marks for this exam add to 60.

6. **Good Luck!**

Part A: Multiple Choice Questions (20 Marks)

Answer the following <u>twenty</u> (20) questions in **your answer booklet** (**not on this paper**). Clearly number all questions and write your answers in CAPITAL LETTERS.

1. If a firm differentiates its product from its competitors, its demand curve becomes:

    (A) more elastic.
    (B) less elastic.
    (C) shifts inward.
    (D) does not change.

Questions 2 and 3 relate to the following game. In each cell, the first number is the payoff of I (who picks the row) while the second is the payoff of II (who picks the column).

	II		
	L	C	R
U	20, 20	0, 50	0, 40
M	25, 0	70, 70	0, 80
B	75, 0	20, 5	60, 60

2. Consider the above game. Which of the following statements are true:

    (A) C is dominated by L for player II
    (B) L is dominated by R for player II
    (C) R is dominated by L for player II
    (D) L is dominated by C for player II

3. Consider again the above game. Which of the following constitute a Nash equilibrium:

   (A) I chooses M and II chooses C
   (B) I chooses B and II chooses R
   (C) I chooses U and II chooses L
   (D) both A and B.

4. The restaurants on Main Street are in monopolistic competition. In the long-run, meal prices will:

   (A) tend towards marginal cost
   (B) tend towards long-run average cost
   (C) tend towards short-run average cost
   (D) equal fixed costs

5. A firm operating in an oligopoly will produce output at the point at which:

   (A) total revenue is maximised
   (B) marginal revenue is maximised
   (C) total cost is minimised
   (D) marginal revenue equals marginal cost.

6. If firms in an oligopoly are myopic (i.e., discount the future heavily), they are more likely to:

   (A) engage in competitive behaviour than collusive behaviour
   (B) sustain collusive outcomes
   (C) get into price wars more often
   (D) both A and D.

7. Suppose there are two firms in an industry. When production quantities can be easily changed, if its rival drops its price, a firm will maximise profits by:

   (A) leaving its price and quantity unchanged.
   (B) cutting output and raising price.
   (C) expanding output and raising price
   (D) expanding output and cutting price

8. Your firm is in a duopoly. When you drop your price, your rival is likely to follow. If you agree to wage rises for your employees, this is likely to have:

(A) a negative strategic effect
(B) a positive strategic effect
(C) no strategic effect
(D) no effect on profits at all.

9. A firm is a monopoly in an industry. Its production technology has falling long-run average costs. There are no other entry barriers. In addition, production does not involve any sunk costs. That is, all equipment and plant can be easily sold or reconverted to other uses. The firm will set its price equal to:

(A) a simple monopoly price (i.e., at the quantity where marginal revenue equals marginal cost)
(B) short-run marginal cost.
(C) long-run average cost
(D) zero.

10. An average consumer's willingness to pay for a Windows-based personal computer is higher when there:

(A) is more software available for Windows-based computers
(B) are more Windows-based computers in the workplace
(C) are more Windows-trained users
(D) All of the above.

11. By definition, a Nash equilibrium is where each player

(A) plays a dominant strategy
(B) gets the highest possible payoffs
(C) gets the highest payoff possible without lowering the opponents' payoff
(D) plays the best strategy given the other's strategies.

12. Radio City promises that if you can find a lower advertised price for anything you bought at Radio City, anywhere in town within 30 days, it will return the difference plus 20 percent. A game theoretic analysis suggests Radio City may be

(A) losing money in the long run.
(B) Competing aggressively with the other firms.
(C) Openly colluding with the other firms.
(D) Trying to force the other firms to exit the industry.

13. Cartels can only exist

(A) in oligopoly markets.
(B) When products are homogeneous
(C) When products are not homogeneous
(D) In countries where they are legal

14. Potential entrant E threatens to enter incumbent I's market and I promises to lower price to P should E enter. For I to credibly deter E's entry, E must believe,

(A) P > I's average variable cost
(B) I could conceivably charge P without E's threat.
(C) P is low enough to discourage E.
(D) P > I's average total cost.

15. A most-favoured–customer clause

(A) is a commitment but not a threat
(B) is a threat but not a commitment
(C) is both a threat and a commitment
(D) is neither a threat nor a commitment

16. A dominated strategy is one that

(A) beats all others, regardless of the opponent's choice
(B) beats all others , given the opponent's choice
(C) is beaten by some other strategy regardless of the opponent's choice
(D) is beaten by some other strategy contingent on the opponent's choice

17. Profit maximising cartels choose price equal to

   (A) marginal cost
   (B) average total cost of the last unit
   (C) marginal revenue
   (D) the monopoly price.

18. Suppose a potential entrant is choosing between entering and not entering a given market. The incumbent, post-entry, may or may not fight a price war. If the returns (to the entrant first, incumbent second) from the possible actions are : enter, fight (-3, 3); enter, not fight (4,4); not enter (0, 10) then

   (A) there are no Nash equilibria of this game
   (B) there is only one Nash equilibrium of this game
   (C) there are two Nash equilibrium of this game
   (D) there are three Nash equilibrium of this game

19. Consider the entry game in Question 18 above, given the payoffs we expect the potential entrant

   (A) to not enter the market.
   (B) to enter and be faced with a price war
   (C) to enter and the incumbent to accommodate that entry
   (D) not enough information

20. Consider the entry game in Question 18 above, but suppose instead that some external pressures have resulted in the payoff associated from not fighting the potential entrant to the incumbent to go from 4 to –10. Given the payoffs, we expect

   (A) to not enter the market.
   (B) to enter and be faced with a price war
   (C) to enter and the incumbent to accommodate that entry
   (D) not enough information

Part B: Short Answer Questions

Choose **two** **(2) out of the** **four** **(4)** following questions in the examination booklet provided. Indicate on the front of that booklet your two choices. You will be graded on these and these only.

QUESTION 1:

Summer Isle is a popular summer vacationing spot. The only way to get to Summer Isle is to take a plane from Coast City, 300 kilometers away. There are two firms that fly the route from Coast City to Summer Isle – Summer Isle Air (SIA) and Coast City Air (CCA). Each has one light aircraft. It is known to all in the industry that the Light Plane 2000 made by General Planes Inc. – a US company – is the plane that can handle the route at the least cost. This makes General Planes a monopolist over aircraft – and spare parts -- supply for that route. Indeed, the Coast City–Summer Isle route is the only one (in the world!) that uses the Light Plane 2000.

(a) Characterise the type of duopoly competition that exists between SIA and CCA. Each can choose its ticket price and also set the number of flights per day. Does your answer depend on the time of the year – summer versus winter seasons?

(b) If General Planes increases the price of spare parts on the Light Plane 2000, how are ticket prices and flights per day likely to change over the Coast City–Summer Isle route?

(c) Another airline company – Plane Manufacturing Co -- invents the Sleek Plane 3000; a plane that can more efficiently (i.e., with lower running costs) travel the Coast City–Summer Isle route? Neither SIA nor CCA wish to buy the new plane as their current planes are still fully operational. However, an entrepreneur signs an exclusive deal with Plane Manufacturing for the Sleek Plane 3000. That is, Plane Manufacturing agrees not to sell the Sleek Plane 3000 to either SIA or CCA. Will the entrepreneur enter the Coast City–Summer Isle market? If it does, what does this do to prices and flights per day? Clearly state any assumptions used in your analysis.

(d) Complaints from SIA and CCA cause the government to break General Planes' monopoly over spare parts for the Light Plane 2000. Does this make entry by another firm more or less likely? Ultimately, do you think vacationers will benefit from the break up of the General Planes monopoly?

(e) Suppose that airline attendants working on the Coast City–Summer Isle route form a union. All attendants – whether employees of SIA or CCA – join. In setting their wage terms, is the union likely to act in a similar matter to General Planes? If not, why not? Suppose an entrepreneur is considering entering the Coast City–Summer Isle route using non-union labour. If the government outlaws the union, is such entry

more or less likely? What is the likely ultimate effect on ticket prices resulting from the government's decision to outlaw the union?

QUESTION 2:

SmallCo is a small biotechnology start-up. It has developed a new device for detecting viruses in human blood. It has been able to obtain an international patent on this device. Now SmallCo has to decide how best to commercialise its product.

If SmallCo wants to produce the product itself, it will have to invest $0.5m in a plant. However, it will also have to compete against an incumbent firm – BigCo - who has a monopoly over an inferior device for detecting viruses. SmallCo will compete directly with BigCo. It expects its profits, not taking into account the plant cost, to be $2m. BigCo's profits will fall from their monopoly level to $4m if SmallCo enters the product market.

SmallCo has another option. It can license the patent to BigCo. By granting such a license, BigCo will be able to produce and sell the new device and withdraw its own inferior device from the market. However, it will have to spend $100,000 in re-tooling its existing plant. If SmallCo grants BigCo a license, BigCo also has to pay SmallCo a fee.

The resulting profits, *not taking account plant costs or the license fee payments*, are depicted in the following table:

Firm	No License – SmallCo and BigCo compete with different products	License granted and SmallCo does not enter the product market – BigCo. Monopoly	License granted and SmallCo enters the product market – SmallCo and BigCo compete with identical products
BigCo	$4m	$10m	$3m
SmallCo	$2m	$0	$1m

PLEASE TURN OVER FOR QUESTION 2 questions

QUESTION 2 (continued):

(a) In bargaining over the license fee, suppose that SmallCo can make a once-off, take-it-or-leave-it offer to BigCo. Suppose that SmallCo guarantees, as part of its offer, not to enter the product market. What offer will SmallCo make? Will BigCo agree to it?

(b) The government becomes concerned about the anti-competitive effects of patent licensing. It will allow licensing but *not* agreements whereby SmallCo guarantees not to enter the product market entry. How will this new policy alter the game? In particular, will this change the offer that SmallCo makes?

(c) Whether a firm invests in research and development to generate an innovation depends critically on its expected returns. For SmallCo, compare its expected returns when there is a ban on entry restricting agreements to its return in your answer in question (b). What does the ban do to innovation in the industry? Is such a ban likely to improve competition?

(d) Suppose now that there is no government ban, but the patent on SmallCo's device is weak. BigCo can easily imitate the design. What does this do to SmallCo's incentive to innovate? Suppose that it takes BigCo some time to imitate SmallCo's design. Intuitively, what does this possibility do to the license fee SmallCo can expect to receive for its innovation?

QUESTION 3:

In a one-shot game, if you advertise and your rival advertises, you will each earn $5 million in profits. If neither of you advertises, your rival will make $4 million and you will make $2 million. If you advertise and your rival does not, you will make $10 million and your rival will make $3 million. If your rival advertises and you do not, you will make $1 million and your rival will make $3 million.

(a) Write the above game in normal (matrix) form.

(b) Does your rival or you have a dominant strategy?

(c) What is the Nash equilibrium for the one-shot game?

(d) How much would you be willing to bribe your rival not to advertise? How does this change the game? Is this credible? Explain carefully.

(e) Is this the same as a Prisoner's Dilemma game? Why or why not?

QUESTION 4:

Two firms, Bic and Gillette dominate the market for disposable razors. They behave as Cournot competitors and they face a market demand curve:

$P = 200 - 2Q$

Where P is the price of razors and Q is the total market output (assume that the two types of razors are identical). Bic's marginal cost of production is 10 and Gillette's marginal cost is 30. Fixed costs for both firms are zero.

(a) How much will each firm produce in equilibrium?

(b) Is this a Nash equilibrium? Why or why not (justify your answer by referring to the reaction functions)?

(c) If the two firms behaved as Bertrand competitors explain briefly the resulting market equilibrium. (detail your assumptions carefully)

(d) Suppose that the two firms are producing differentiated products and competing on prices, explain, using a diagram, the benefit to Gillette of undertaking a repositioning strategy furthering the distance between Bic and Gillette in the the mind of consumers.