

OLLSCOIL NA hEIREANN, GAILLIMH  
THE NATIONAL UNIVERSITY OF IRELAND, GALWAY

AUTUMN EXAMINATIONS 2001/2002

**EC209 Managerial Economics**

2<sup>nd</sup> B.Comm., 2<sup>nd</sup> B.Comm. with Language, 2<sup>nd</sup> B.Corp.Law, 3<sup>rd</sup> Ind. Engineering

Professor H. Dixon  
Professor M.P. Cuddy  
Dr. S. Steele

**Time allowed: THREE hours.**

**Instructions:**

The distribution of marks is as follows:

- Section A: 30 marks (approximately 60 minutes)
- Section B: 20 marks (approximately 30 minutes)
- Section C: 20 marks (approximately 30 minutes)
- Section D: 30 marks (approximately 60 minutes)

**Total marks: 100**

Detailed instructions:

- Section A: Answer **ALL** questions. The marks to each question are indicated.
- Section B: Answer **ALL** questions. The questions carry equal marks.
- Section C: Answer **ALL** questions. The questions carry equal marks.
- Section D: Answer **TWO** questions. The questions carry equal marks.

## Section A

**Instructions:** Answer ALL questions. This section is worth 30 marks.

1. Consider the following linear demand curve:  $P = 200 - Q$ . Assume two identical firms produce identical output ( $Q$ ) with marginal cost equal to €20. Copy the following table in your exam book and fill the values as you complete the question.

Market Scenario	Total Output	Price of Output	Output for Firm A	Output for Firm B	Economic Profit for Firm A	Economic Profit for Firm B
Competition			Not applicable	Not applicable		
Cournot Duopoly						
Collusion						

- If instead of two firms, there were many firms producing the output ( $Q$ ) all with a marginal cost equal to €20, how much of the product would be produced? What would be the price for the output? Consider that Firm A and Firm B are involved in this competitive market. What is the economic profit that they make? Input answers in your table.
- Now, assuming all other firms in the market have vanished except for Firm A and Firm B. Consider that Firm A and Firm B are involved in Cournot Competition where each chooses their output taking the other firm's output as given. Derive (a reaction function) an expression that shows the optimal output for one firm as a function of the output of the other firm [**Circle this answer clearly**].
- Fill in the table for the Cournot equilibrium giving (1) total output, (2) price, (3) output for each firm, and (4) economic profit for each firm.
- Suppose the two firms are able to work together-collude-how much total output would be produced if the firms were able to collude to maximise joint profits? Fill in your table giving (1) total output, (2) price, (3) output for each firm, and (4) economic profit for the each firm.
- Compared to the monopoly case do consumers receive more consumer surplus when the Cournot equilibrium is realised?

## Section B

### Instructions:

Answer each of the following questions by choosing the best answer from those given. Please write your answers clearly in a straight line down the page in your exam book. Each question is worth TWO marks. This section is worth 20 marks.

Use the following information and Normal-form game for Questions 1 and 2.

Two different manufacturers make painkiller A-OK and Painkiller Wanna-B. A-OK has a natural market advantage due to its brand identity. Wanna-B is considering an ad campaign to question A-OK's quality reputation. If A-OK advertises to maintain its quality reputation it will be quite costly. The strategic form game specified below specifies the payoffs under these various scenarios. Payoffs are net profits after advertising costs, in millions per year.

		Wanna-B	
		Advertise	Don't Advertise
A-OK	Advertise	\$8 \$18	\$0 \$34
	Don't Advertise	\$14 \$14	\$40 \$6

1. Referring to the Normal-Form game between A-OK and Wanna-B, which of the following is true?
  - (a) The Nash equilibrium is for both to choose 'Advertise'
  - (b) The Nash equilibrium is for both to choose 'Don't Advertise'
  - (c) The Nash equilibrium is for A-OK to choose 'Advertise' and Wanna-B to choose 'Don't Advertise'
  - (d) The Nash equilibrium is for A-OK to choose 'Don't Advertise' and Wanna-B to choose 'Advertise'
  - (e) There is no pure strategy Nash equilibrium
  
2. Again, referring to the Normal-Form game between A-OK and Wanna-B, which of the following is true?
  - (a) The Nash equilibrium is a dominant-strategy equilibrium
  - (b) A-OK has a dominant-strategy
  - (c) Wanna-B has a dominant strategy
  - (d) Neither player has a dominant strategy

3. In the basic principal/agent model, to increase employee effort managers should:
- (a) increase the incentive coefficient
  - (b) increase the fixed wage
  - (c) reduce the likelihood of being fired
  - (d) reduce the impact of random shocks
4. Incentive pay should generally be higher when the:
- (a) employee's output is less sensitive to his or her effort
  - (b) employee is more risk averse
  - (c) level of risk beyond the employee's control is low
  - (d) employee response to increased incentives is low
5. When employee turnover is low and number of job applications is high, the firm:
- (a) is probably paying more than the market wage
  - (b) is probably paying the market wage
  - (c) is probably paying less than the market wage
  - (d) cannot determine the market wage relative to its price
6. The principle challenge in designing firms is to maximize the likelihood that the decision makers:
- (a) are sufficiently rewarded for their efforts
  - (b) have the relevant information and the incentive to use it productively
  - (c) have controls on their behaviour
  - (d) increase sales
7. Decision rights:
- (a) must be retained by senior managers
  - (b) must be delegated to middle managers
  - (c) are delegated to control agency problems
  - (d) are delegated to take advantage of specific knowledge
8. Company customs, taboos, slogans, role models, and social rituals:
- (a) have no effect on employee decisions
  - (b) can only hinder the effectiveness of organizational decision makers
  - (c) help define employee expectations
  - (d) are substitutes for the components of organizational architecture

9. Decentralizing a decision right will likely result in:
- (a) lower agency costs
  - (b) greater probability of coordination failures
  - (c) poor decisions due to lack of information
  - (d) less time for senior management to focus on strategic decisions
10. By grouping people with a subunit, firms:
- (a) increase the costs of coordination among the people within the subunit
  - (b) decrease the costs of communication among the people within the subunit
  - (c) decrease the costs of coordination across subunits
  - (d) decrease the costs of communication across subunits

## Section C

### Instructions:

Answer TRUE or FALSE to each of the following questions. If you answer FALSE, explain WHY the statement is False. You get ONE mark for a correct indication of FALSE and ONE mark for explaining why the statement is FALSE. Please write your answers clearly in a straight line down the page in your exam book. Each question is worth TWO marks. This section is worth 20 marks.

Use the following information to answer Questions 1 - 3.

Jim estimates the following annual demand function for the Ford automobiles he sells:

$$Q = 800 - 50P + 30P_c - 10P_g + 30I$$

Where  $P$  is the price of Jim's Fords (in thousands of Pounds),  $P_c$  is the average price of Chevrolets (in thousands of Irish Pounds),  $P_g$  is the average price of petrol in the local area (in pounds per litre), and  $I$  is the average income of the local population (in thousands of Irish pounds). Assume Chevrolets are priced at 15,000, the average price of petrol is £1.20 per litre, and the average local income is 20,000.

1. According to the demand function, Jim will sell 830 cars if he charges 20,000 per car.
2. To sell 1,000 cars Jim would have to charge a price of 16,820.
3. The slope of the demand curve derived from the above information is equal to:  $-1/40$ .
4. The extra wage paid to attract an individual to less desirable jobs is called an efficiency wage.
5. A negative cross price elasticity of demand means that the two goods are complements to each other.

6. The following two-person game does not have a mixed-strategy equilibrium. (Note: the first number in the brackets () is payoff to Boeing and the second number is payoff to Airbus).

		Airbus	
		Negative Campaign	Positive Campaign
Boeing	Negative Campaign	(£40, -£40)	(-£40, £40)
	Positive Campaign	(-£40, £40)	(£40, -£40)

7. An example of adverse selection is where someone chooses a car that is not as good as it is claimed to be.
8. Employees generally believe that salary and fringe benefits are perfect.
9. In the Principal-Agent model developed text, the primary reason for the need to construct an incentive contract is asymmetric information.
10. In a Nash equilibrium everyone must be playing a dominant strategy.

## Section D

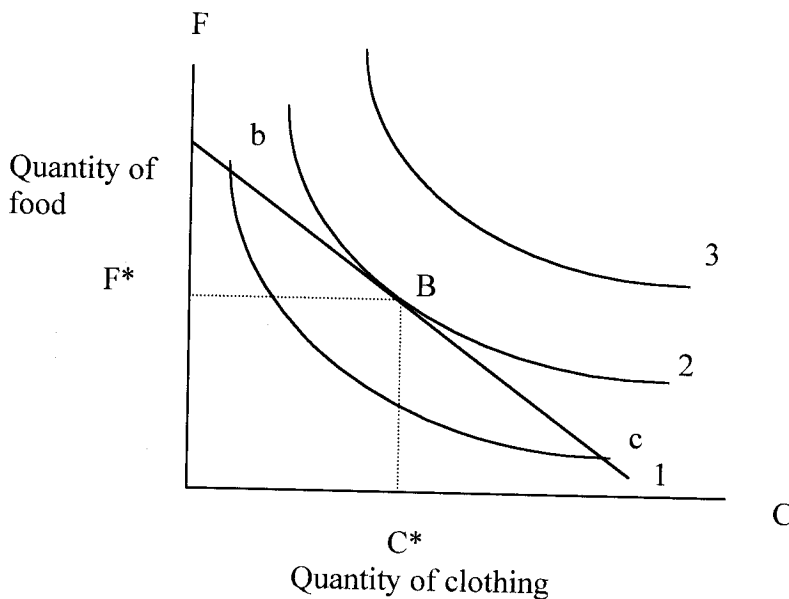
### Instructions:

Answer TWO of the following three questions. Each question is worth 15 marks. This section is worth 30 marks.

Only two questions will be marked. If more than two questions are attempted the instructor will RANDOMLY choose two responses to mark.

1. Graphical analysis and consumer behaviour questions:

- Assume a consumer has an income ( $I$ ) and lives in a three-good world. The goods that can be purchased are fish ( $F$ ), rice ( $R$ ), and chip ( $C$ ). Prices are represented by  $P_F$ ,  $P_R$ , and  $P_C$  for fish, rice, and chips, respectively. Write down the consumer's budget constraint.
- Can graph this budget constraint? If, Yes, draw the graph. If No, explain why you are unable to do so.
- Now consider the following diagram from your textbook.



- What are the curves 1, 2, and 3 called? Explain what these curves represent
- What does the straight line represent? Given income  $I$  and prices of  $P_f$  and  $P_c$ , write down an equation for this line. In symbols provide the slope and intercepts for this line.



2. A tax preparation firm hires both book-keepers and accountants to process household tax returns. Currently both types of workers are assigned to the preparation of simple household returns. Assume the firm pays market salary and benefits, which are \$20 per hour for book-keepers and \$40 for accountants. Productivity data the firm has collected shows that in an 8-hour day, book-keepers can process 12 tax returns and accountants can process 14 of the same type of tax returns. Assume the quality of the tax return preparation is the same across these two skill levels. If the firm currently hiring a cost minimizing ("optimal") mix of book-keepers and accountants? Or would you recommend that the firm increase its hiring of book-keepers relative to accountants, or vice-versa? Explain carefully.
3. Consider the following game of oil production between two countries. The numbers in the matrix represent payoffs in billions of Irish Pounds. (Note: the first number in the brackets () is payoff to Cridetopia, and the second number if payoff to Oil-land.

		Oil-land	
		Low Output	High Output
Credetopia	Low Output	(£84, £84)	(£50, £100)
	High Output	(£100, £50)	(£60, £60)

- (a) Find the Nash equilibrium for the simultaneous play game
- (b) If Credetopia were to move first, would it have a first-mover advantage? (Hint: Write out the game in extensive form).
- (c) If Oil-land were to move first, would it have a first-mover advantage?
- (d) If one country or the other has a first-mover advantage explain why. If neither has this advantage explain why.