

The University of Sydney

Strategic Business Relationships

ECON 5026

Mid-semester Test

September, 2019

SID: _____

Instructions:

Total marks: 45 marks

Time permitted: 90 minutes

Permitted materials: Calculators are permitted.
Mobile phones are NOT permitted.

Section A: Answer all questions in the booklet provided.
Marks for each question are in parentheses ().
It is not sufficient to write the answers to each question.
Provide working and explanations for all answers.

Do not begin the test until instructed.

Good luck!

1. Bubbles and Crazy Juices are two rival bottled drink manufacturers. Both are considering launching a new carbonated guava juice drink on the Sydney University campus. There is sufficient demand to sustain only one carbonated guava drink. Bubbles and Crazy must simultaneously decide whether to launch or stay out of the market. The matrix below summarises payoffs.

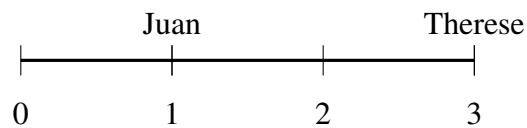
		Crazy	
		Launch	Out
Bubbles	Launch	-60, -80	120, 0
	Out	0, 120	0, 0

- (a) Identify all Nash equilibria to this game. [8 marks]
- (b) The CEO at Crazy Juices thinks it would be a good idea to wait to gather information before deciding whether to launch. Consider a sequential moves game in which Bubbles makes their launch decision first. Crazy observes this decision and then chooses whether to launch. Illustrate this game with a diagram and solve for the subgame perfect Nash equilibrium to the game. Would you advise the CEO at Crazy to wait? Explain. [7 marks]
2. The demand for good X is given by $P(Q) = 128 - 2Q$, where Q is the market quantity, and P is the market price. Production of good X involves costs of $C(q) = 200 + 8q$, where q is firm output.
- (a) Suppose a single firm operates in the market. Find the profit-maximising price and quantity of the monopolist. [3 marks]
- (b) Suppose two firms engage in simultaneous quantity competition in a single period.
- Find the reaction function for each firm. [4 marks]
 - Find the Nash equilibrium outputs of both firms. [3 marks]
- (c) Suppose that two firms operate in the market. The firms engage in Stackelberg competition. Firm 1 chooses its output first, then Firm 2 chooses its output. Find the output of each firm in the subgame perfect Nash equilibrium. [5 marks]

3. Juan and Therese each own a Taco restaurant in the town of Burritoville. The town is 3km long. Juan is located 1km along the town, and Therese is at 3km along (see the figure below). 300 Consumers are uniformly located along the town (between 0 and 3). Consumer i 's utility derived from dining at restaurant j is given by

$$u_{ij} = \bar{u} - t|x_i - y_j| - p_j,$$

where $j = 1, 2$ indicate the two restaurants, t is the per unit cost of travelling along the town, x_i is the location of consumer i , y_j is the location of restaurant j , and p_j is the price of restaurant j . Each consumer eats a meal at exactly one restaurant. Restaurants compete with each other by simultaneously choosing prices. Each restaurant has constant marginal costs of c and no fixed costs.



- (a) Calculate the demand for each restaurant in terms market prices and transport costs. [4 marks]
- (b) Find the reaction function for each restaurant. [4 marks]
- (c) Find the Nash equilibrium prices and quantities for each restaurant. [4 marks]
- (d) Explain why Juan sets higher prices than Therese in equilibrium. [3 marks]

END OF THE TEST