

**UBC
Managerial Economics: Commerce/ FRE 295**

Final Exam: December 5, 2012

NAME: _____, _____ (please print)
 (Surname) (Given Names)

SIGNATURE: _____

STUDENT NUMBER _____

SECTION: _____

PROFESSOR'S NAME: _____

EXAM ROOM _____

Section 101	MW 10:00-11:30	J. Brander
Section 102	MW 11:30 – 1:00	J. Brander
Section 103	MW 1:00-2:30	M. Tappata
Section 104	MW 2:30-4:00	M. Tappata
Section 105	MW 4:00-5:30	S. Meyer
Section 106	TTh 11:00-12:30	J. Vercammen
Section 107	TTh 2:00-3:30	R. Shrestha

Maximum Score: 100

Time Available: 2 hours (120 minutes).

Instructions:

There are two parts to this exam. The first part consists of 20 multiple-choice questions and the second contains 5 longer questions. Please answer all multiple choice questions and **choose 4 out of 5 longer questions**. If you do all 5 questions the last question will not be marked. The longer questions are worth 60% of the exam so you should make sure you leave enough time to do these questions.

This is a closed-book exam. You may not use books, notes, or electronic devices such as smartphones or computers except that you may use a basic (non-programmable) calculator.

You may use pen or pencil. Answers must go in the indicated places. For the multiple choice questions you must transfer your answers to the answer sheet, which is the next page in this exam.

For each longer question your answer must fit in the indicated space. However, if you wish to re-do a question, you may cross out your answer and provide the answer somewhere else on the exam, such as on the back of a page, but the total space used should be no more than allowed in the original question.

Please do not leave the exam room during the final 15 minutes of the exam, as that is disruptive to other students. If you have a question or want scrap paper just raise your hand.

PART I. MULTIPLE CHOICE ANSWERS (Use letters A, B, C, or D.) Put your answers here. Multiple choice answers placed elsewhere will not be marked.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

16. _____

17. _____

18. _____

19. _____

20. _____

Total Multiple Choice Marks: _____ / 40

PART II: Marks for Longer Questions: (Choose 4 questions out of 5.)

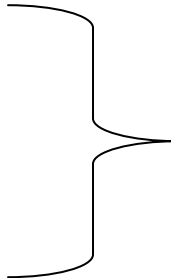
Question 1. _____

Question 2. _____

Question 3. _____

Question 4. _____

Question 5. _____



Students, do NOT complete this section. This section will be completed by the graders.

Total Longer Question Marks: _____ / 60

Overall Mark: _____ / 100

PART I

MULTIPLE CHOICE QUESTIONS

Each question has one correct response. There are 20 questions. Each question is worth 2 pts. If you choose the correct answer you get 2 pts. Otherwise you get no points for that question. **Transfer your answers to the answer page (p. 2).**

- Supply and demand:* Suppose the demand curve for magazines is $Q_d = 5 - 2p$ and the supply curve for magazines is $Q_s = 8p$.
 - The equilibrium price is 0.5.
 - If magazines are a normal good, an increase in income will cause price to fall.
 - In equilibrium the quantity demanded will exceed the quantity supplied
 - None of the above
- Elasticity:* A monopoly provider of kayak rentals changed its price from \$40 to \$60. As a result quantity demanded fell from 210 rentals per day to 190 rentals per day. From this information we can determine that the price elasticity of demand for this change is
 - Elastic
 - Inelastic
 - Unitary
 - Perfectly inelastic
- Regression:* Which of the following statements about regression is true?
 - We normally expect a linear regression equation to fit the data points better than a quadratic regression equation.
 - In regression analysis, if $R^2 = 1.0$ then the data points all lie on the regression line.
 - If an estimated regression equation is: $y = -1.16x^2 + 23.40x + 31.35$, then the estimated increase in y due to a one unit increase in x is 23.40.
 - Both B and C.
- Consumer Choice:* A consumer with standard convex indifference curves maximizes utility over consumption of food and clothing, which are both normal goods. If the price of food increases from \$5 to \$10, and the price of clothing and income remain unchanged, the consumer will move to a _____ indifference curve and will consume _____ food.
 - lower; more
 - lower; less
 - higher; more
 - higher; less

5. *Production:* The production of bicycles, B , is given by the function $B = LK$, where L is labour and K is capital. The production of motorcycles, M , is given by $M = LK^2$. The wage, w , is the same in both industries, as is the cost of capital, r . Which one of the following statements is true:
- B and M both exhibit decreasing returns to scale
 - B and M both exhibit constant returns to scale
 - Both production functions obey the law of diminishing marginal returns for both factors.
 - Assuming cost minimization, bicycle production will use a lower ratio of K to L than motorcycle production.
6. *Cost:* Fancy Furniture, Inc. uses labour, L , and capital, K , in fixed proportions. (L and K are perfect complements in production.) Which of the following statements is true?
- This firm has linear isoquants.
 - This firm will increase its capital-labour ratio if the wage rate rises.
 - Both A and B.
 - None of the above.
7. *Profit Maximization:* A perfectly competitive firm has an upward sloping marginal cost schedule. Suppose the firm violates the rule for maximizing profit by choosing to produce where price is greater than marginal cost.
- The firm's marginal revenue is negative.
 - The firm will necessarily earn negative profits.
 - An increase in output raises marginal cost but does not affect marginal revenue.
 - A small decrease in output will cause profit to increase.
8. *Perfect Competition:* A perfectly competitive industry with identical firms is in short run market equilibrium. The market price is above the minimum of average total cost for each firm. This situation implies:
- Marginal cost is less than average cost at the quantity produced by each firm.
 - Each firm makes positive profits.
 - In the long run the *market* demand schedule must shift in to ensure zero profits for each firm.
 - All of the above.
9. *Monopoly.* Firm A is a monopolist facing (inverse) demand given by $p = 50 - 5Q$ and has a long run cost function given by $C = 100 + 10Q$. The monopolist maximizes profits if:
- $Q = 4$
 - $Q = 8$
 - $Q = 12$
 - It shuts down and produces nothing.

10. *Price Discrimination.* A monopolist with a marginal cost of production $MC = \$10$ per unit faces two groups of consumers. One group has demand $q = 100 - p$ and the other has demand $q = 150 - 2p$. Choose the correct statement:

- A. Under perfect price discrimination the monopolist sells 220 units.
- B. Under multi-group price discrimination the firm sells 110 units.
- C. Under uniform monopoly pricing the firm would earn more profit than under multi-group price discrimination.
- D. Both A and B are correct.

11. *Bundling:* Potter Enterprises has discovered a warehouse full of wands and robes. It sells to 4 types of customers: Students, Witches, Wizards, and Muggles. Each type is equally numerous. The willingness to pay of a typical consumer of each type is shown below. Potter is not concerned about costs and wishes to maximize revenue.

Consumer type	Wand	Robe
Student	25	5
Witch	20	20
Wizard	20	20
Muggle	5	25

- A. Under pure bundling the optimal price is 40.
- B. Under stand-alone pricing wands and robes will each sell for 25.
- C. Under mixed bundling the bundle price is 40.
- D. None of the above.

12. *Pricing:* Which statement about pricing is true? (Assume profit maximization.)

- A. Peak-load pricing extracts all surplus from consumers.
- B. Two-part pricing with different consumers (who face the same access fee and per-unit price) yields the same consumer surplus as perfect price discrimination.
- C. Price discrimination always generates less consumer surplus than uniform monopoly pricing.
- D. None of the above.

13. *Monopolistic Competition:* Which of the following statements best describes the long run equilibrium of a monopolistically competitive industry? (Assume all firms are identical.)

- A. Price is above the minimum of average cost.
- B. In the long run, firms enter the industry until profits for each firm in the industry are equal to zero.
- C. Price is above marginal revenue.
- D. All of the above.

14. *Game Theory I:* Consider the game between Boeing and Airbus as shown below. The game is played just once and both firms move simultaneously. (The first number in each cell is the payoff to Boeing and the second is the payoff to Airbus.)

		Airbus	
		Produce	Don't Produce
Boeing	Produce	-10, -10	100, 0
	Don't Produce	0, 100	0, 0

- A. There are multiple Nash equilibria in this game.
 B. This is a Prisoner's dilemma game.
 C. There is no equilibrium in pure strategies in this game, but there is a mixed strategy equilibrium.
 D. In this game, the Maximin solution is also a Nash equilibrium.
15. *Game Theory II:* Consider the following game between Wal-Mart and K Mart. (The first number in each cell is the payoff to Wal-Mart and the second is the payoff to K Mart.)

		K Mart	
		Advertise	Don't Advertise
Wal-Mart	Advertise	30, 30	70, 20
	Don't Advertise	20, 70	60, 60

- A. If this game is played sequentially where K Mart moves first, then in Nash equilibrium K Mart, the leader, gets 70 and Wal-Mart gets 20.
 B. If this game is played just once and the firms move simultaneously, the Nash equilibrium allows each firm to earn 60.
 C. If the simultaneous-move version of the game is repeated indefinitely, the use of tit-for-tat strategies can support a Nash equilibrium in which each firm earns 60 each period.
 D. None of the above.
16. *Uncertainty I:* A risk averse student would always

- A. Take a 20% chance of \$1000 over a certain \$200.
 B. Take a 5% chance of \$500 over a certain \$20.
 C. Take a certain \$100 over a 15% chance of 1,000 and an 85% chance of zero.
 D. Take a certain \$44 over a 30% chance of \$100 and a 70% chance of \$20.

17. *Uncertainty II*. Billy is faced with an opportunity to invest in WKRP Industries by buying WKRP stock. The stock price is currently \$10 per share. There is a 40% chance that this share price will go to \$20, a 40% chance it will go to zero, and a 20% chance it will stay at \$10. These amounts are common knowledge and are assumed to be correct. Billy maximizes expected utility.
- A. If Billy's utility function over wealth is convex to the origin (bowed up) he will buy this investment.
 - B. If Billy is risk averse he can eliminate the risk associated with buying WKRP stock by also buying another stock that is positively correlated with WKRP.
 - C. If Billy is risk neutral and owns this WKRP stock, he would benefit from purchasing actuarially fair insurance that would offset his losses if the stock loses value.
 - D. None of the above.
18. *Behavioural Economics*: The framing effect refers to a tendency of many decision-makers to change their decisions depending on how a decision problem is framed or described even if the underlying economic fundamentals are unchanged. This effect can be explained by
- A. Prospect Theory.
 - B. The Reciprocity Norm.
 - C. The Ultimatum Game.
 - D. All of the above.
19. *Asymmetric Information*: The two main types of informational asymmetry can be viewed as arising from hidden action and hidden characteristics. Hidden action can cause _____, and hidden characteristics can cause _____. These blanks can be correctly filled in (in order) with the words:
- A. Adverse selection and moral hazard.
 - B. Moral hazard and adverse selection.
 - C. Signaling and screening.
 - D. Agency problems and moral hazard.
20. *Market Failure*: Suppose a market failure has resulted in a \$2000 deadweight loss.
- A. The difference between consumer surplus and producer surplus is equal to \$2000.
 - B. A government policy which eliminates the deadweight loss is always Pareto improving.
 - C. If a government policy eliminates the market failure then total surplus will rise by \$2000.
 - D. It is never possible for a government to use a subsidy to eliminate deadweight loss.

Part II

LONGER QUESTIONS

Choose 4 questions out of 5. If you do all 5 questions the last question will not be marked. Show your working and provide (brief) explanations where appropriate. Confine your answers to the space provided in the question. You may cross out an answer and do the entire answer somewhere else if necessary but the total space used cannot exceed the original space provided.

1. Oligopoly

a) (8 pts) Ocean Cement produces output x and Mountain Cement produces y . The two firms compete as Cournot oligopolists. Cement is a homogeneous product and the (inverse) demand curve is $p = 100 - Q$, where $Q = x + y$. The marginal cost for Ocean Cement is 20 and the marginal cost for Mountain Cement is 40. Determine the best response function for each firm. Do NOT calculate the Cournot equilibrium but draw the best response diagram. State whether one firm will produce more output in equilibrium and briefly explain why.

b) (7 pts) The demand for Pepsi's case of soda cans is given by $Q_p = 50 - 5P_p + 2P_c$ where P_p is Pepsi's price and P_c represents Coke's price. The demand for Coke is $Q_c = 50 - 5P_c + 2P_p$. The choice variable for each firm is its price. Assume Coke is a leader and sets the price before Pepsi. The follower, Pepsi, chooses its price after observing Coke's price. Based on these demand functions, are Coke and Pepsi differentiated or identical products? (Explain your reasoning.) Determine Pepsi's best response function. (Hint: set up the profit function as a function of prices.) Do NOT calculate the equilibrium and do NOT draw a diagram but explain briefly in words what Coke should do to maximize its profit.

Answer:

We know that Coke and Pepsi are (identical, differentiated) [Choose one] because

To find Pepsi's best response function we write down its profit as a function of the prices as follows:

We derive the best response function as follows:

Pepsi's best response function is therefore:

If it knows this best response function for Pepsi, Coke should

2. Game Theory

a) (7 pts) Consider the following one-shot game (where $X > 0$) between Nokia and Alcatel in which each of them can choose either a high price or a low price. For what values of X does Alcatel have a dominant strategy? For what values of X does Nokia have a dominant strategy? For what values of X does neither firm have a dominant strategy? Is there any Nash equilibrium (in pure strategies) in this game if neither firm has a dominant strategy? (Dominance means “strict dominance”: A dominates B only if and only if $A > B$.)

		Nokia	
		High Price (HP)	Low Price (LP)
Alcatel	High Price (HP)	120, 120	15, 130
	Low Price (LP)	$70 + X, 70 - X$	50, 50

Answer:

Alcatel has a dominant strategy if X

Boeing has a dominant strategy if X

Therefore, neither firm has a dominant strategy if X

If neither firm has a dominant strategy this means X

If X takes on this range of values, what can you say about the existence of a Nash equilibrium?

b) (8 pts) Consider a game between a potential entrant and an Incumbent. If there is no entry, the incumbent makes a monopoly profit equal to \$100. If the potential entrant enters, the incumbent has two choices: either to accommodate the entry or wage a price war. In case of accommodation, the incumbent makes $\$60 - X$ (where $X > 0$ is the cost of accommodation) and the entrant \$20. On the other hand in case of price war, the entrant suffers a loss of \$40 while the incumbent makes \$50. Prior to the game, the incumbent threatens the entrant to wage a price war in case the entrant enters. For what range of values of X will this threaten be credible? Draw a tree diagram and explain your answer. Also find the subgame perfect Nash equilibrium of this game for $X = 15$.

3. **Uncertainty:** Mary-Jane is a contestant on a weekly game show and has just won the right to flip a coin to get a prize. She will receive \$100 if the coin toss is heads and \$400 if the coin toss is tails. Her utility function is $U(Y) = Y^{0.5}$ where Y is her income from the coin toss.

a. (7 pts) Calculate the expected income from the coin toss, the variance of income, the standard deviation, and the expected utility for Mary-Jane. Is she risk averse, risk neutral, or risk preferring? Provide formulas and numerical answers below.

Expected Income =

Variance =

Standard Deviation =

Expected Utility =

Mary Jane is (risk averse, risk neutral, risk preferring) [Choose one] because

b. (8 pts) Before the coin is flipped the host of the show offers Mary-Jane \$230 in cash instead of flipping the coin. Based on expected utility theory should she take the \$230 cash or toss the coin? Calculate the risk premium and explain how you can use it to determine whether Mary-Jane should toss the coin or not. Illustrate the expected income from the coin toss, the risk premium and the utility function in a diagram.



RP, the risk premium =

4. Asymmetric Information

a) (8 pts) Consider a used car market with sellers of good used cars and sellers of poor used cars (lemons). There are many potential buyers who would be willing to pay up to \$10,000 for a good used car and \$5000 for a lemon. There are 100 cars of each type available to be sold. Sellers of good used cars will not accept less than \$8000 and sellers of lemons will not accept less than \$4000. Buyers cannot tell the cars apart. Buyers and sellers are all risk neutral. In equilibrium how many cars sell, what is the price, and what (if anything) is the deadweight loss? Explain your reasoning. Start your answer as follows:

Answer:

Initially if buyers believe all cars will sell they will pay the expected value of a car which is _____.

However, sellers of good used cars will

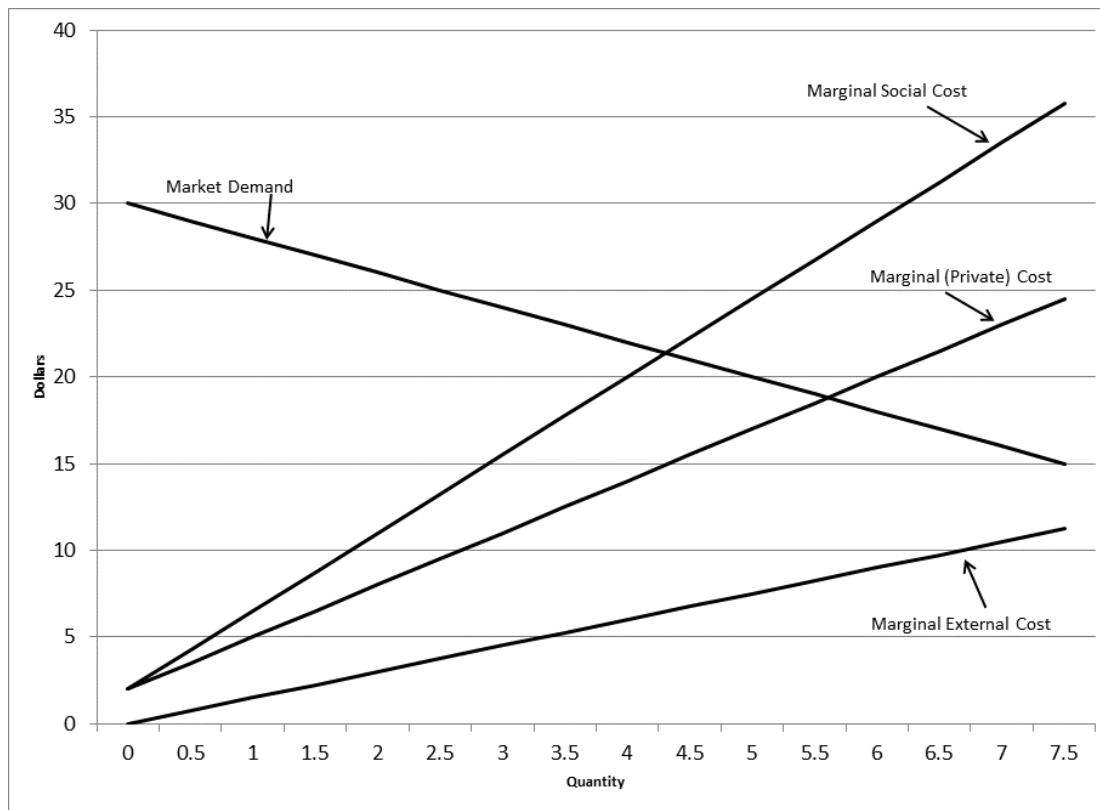
b) (7 pts) Amy manages a restaurant that is owned by Paul, an absentee owner. The daily profit of the restaurant depends on luck and on Amy's effort, as follows:

	Bad Luck	Good Luck
Low Effort	100	300
Normal Effort	300	500
High Effort	500	700

Bad luck and good luck are equally likely, with 50% probability each. Low effort costs Amy nothing. Normal effort costs her 50 and high effort costs her 120. Both Amy and Paul are risk neutral. Paul is considering offering Amy a fixed wage of 60, a profit share of 30% or a profit share of 40%. Which contract is best from Amy's point of view. (Hint: You will need to show what Amy would do for each possible contract.) Which contract would Paul offer? Would anything change if Amy is risk averse?

5. Market Failure

- (a) (8 pts) The diagram below shows a competitive market with a negative externality. The Marginal (Private) Cost is the industry supply curve. Identify on the diagram: (i) the equilibrium level of production in the presence of the externality; (ii) the socially efficient level of production; and (iii) the triangular area which is a measure of dead-weight loss. Is a \$4 tax per unit of output imposed on the producer sufficient to eliminate the deadweight loss? Briefly explain.



(b) (7 pts) Inverse market demand facing a monopolist is given by $P = 100 - Q$. The monopolist operates with zero cost. Suppose consumers join together in a consumer group and offer to pay the monopolist to produce $Q = 100$ units of output instead of just acting like an ordinary monopolist using uniform pricing. What is the most the consumer group would be willing to pay? Is it possible to generate a Pareto improvement compared with uniform monopoly pricing? Explain briefly and include the term “deadweight loss” in your answer.