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14.03
Applied Intermediate Microeconomics
Previous Final Examination

You have 3 hours to complete this exam. The exam has three pages and consists of three parts. The first part contains short answer questions, the second part an analytical question and the third part more open ended questions. The first section carries 30 points, the second part 40 points and third part 30 points. Within each section every question carries the same number of points. Everybody has to answer the question in part two. Parts one and three give you some choice. If you attempt more than the required number of questions clearly label which ones you wish to have graded. Show your work since partial credit will be awarded. Please write legibly.

Good luck!

Part I: Short Answer Questions (30 points) Answer any *six* out of the following eight. Indicate whether the statement is true, false, or uncertain. If the statement is true, explain why. If the statement is false, explain why. If the statement is uncertain, give conditions under which it is true and those under which it is false. In any case, your answers should be short and to the point.

1. The Hicksian (or compensated) demand function for a normal good is steeper than the Marshallian (or uncompensated) demand function.

2. In the two-period model of savings a saver will always save less when the interest rate goes up.

3. A risk averse individual will always prefer the expected value of a gamble for sure over the gamble itself.

4. A firm with a constant returns to scale production function and no fixed costs has constant average and marginal costs.

5. A monopolist with constant marginal costs charging a two part tariff will generally set a per-unit price equal to marginal cost.

6. If average cost is increasing then marginal cost is also increasing. If marginal cost is increasing then average cost is increasing.

7. The adverse selection problem is more serious for insurance firms offering group health insurance to large employers rather than to small employers.

8. A monopoly produces 1 million units of a good. If a \$10 per unit tax is imposed on the good, the profits of the monopolist will decrease by \$10 million.

Part II (40 points) Answer all parts of the following question.

9. American Widgetmakers sells widgets in a market where demand is given by

$$Q = 140 + A - P$$

Q is the quantity demanded, P is the price, and A is the level of advertising expenditures undertaken by the firm. Widgetmakers has a cost function of producing widgets $C(q_1) = 20q_1$. Furthermore, the cost of advertising to the firm is $C_A(A) = A^2$.

   (a) Assume Widgetmakers has a monopoly position in the market and does not undertake advertising. How much does it produce and what are its profits?

   (b) Continue with the assumption that Widgetmakers has a monopoly. How much does it produce when it sets both advertising and output optimally? How much does it advertise? What are its profits?

   (c) Now assume that a competitor, Taiwanese Widget Import and Export (TWIX), enters the market. TWIX has a cost function of selling in the American market given by $C(q_2) = 50q_2$ (because of transportation costs). Suppose the two firms compete as Cournot duopolists. TWIX does not advertise and takes the advertising level of American Widgetmakers as given. Find the output levels for the two firms, the level of advertising and profits for each firm.

   (d) Give the economic intuition why the levels of advertising differ between your answers in (b) and (c).

   (e) Suppose in addition to the assumptions in (c) that TWIX also has a fixed cost of 800 if it sells in the American Market at all. American Widgetmakers has no fixed costs. Suppose the two firms take the following decisions simultaneously: American Widgetmakers decides whether to advertise at the optimal level or not at all and TWIX decides whether to enter the American market or not. What is the Nash equilibrium outcome of this game?

Part III (30 points) Answer *two* out of the following three questions. Feel free to make specific assumptions that help you to answer these questions but state any assumptions you make clearly.

10. The state legislature wants to subsidize day care. It considers two proposals. Under program 1 a family would receive a subsidy of s dollars for each day that the child attends an authorized day care facility. Under program 2 a family with a child registered in an authorized day care facility receives a lump sum subsidy. The state would spend the same amount of money on either proposal. Legislators find it hard to decide on one of the proposals because day care providers lobby for program 1 while parents lobby for program 2. Using indifference curves, show that more day care would be purchased under program 1. Show that parents' utility would be higher under program 2.

11. Explain why only low quality products may be sold in a market where manufacturers can produce different qualities but the quality level is hard to ascertain by consumers prior to purchase. Clearly explain how the possibility of offering warranties may affect the outcome. Should the government require all firms to offer warranties?

12. Many manufacturers feel that outside suppliers can produce parts and intermediate goods more cheaply than they can do themselves in house. But tying yourself to a supplier can create problems as well. Often it is not easy to switch quickly to different supplier, for example if parts need to be produced to the buyer's specifications. This means that a supplier, once establishing a relationship with a buyer, can raise its price, giving the buyer few options other than to pay the higher price in the short run. Of course, the buyer may terminate the relationship and look for another supplier for the coming year. Explain how the buyer may be able to induce the supplier not to "cheat" on the contract by offering a premium above the competitive price. Derive how large this premium has to be.