Midterm Exam

Rules: Closed book, no notes other than the attached official list of formulas. No electronic devices other than basic calculators. 105 minutes. Write your answers clearly on 8x11" paper **in order** (part I then part II) and put **your name** on each page.

Part I. Short answers. 50 word maximum per question. "TFU?E" means "True, false or uncertain? Explain briefly." 5 points each.
1. Suppose that market demand declines in a highly competitive industry. In the long run we should expect to see lower prices. TFU?E
2. Cellphone service providers are better described by the Cournot than by other oligopoly models. TFU?E.
3. Vertical integration is the best solution to the hold-up problem. TFU?E
4. A monopoly automatically earns higher profits than any firm in a competitive industry. TFU?E.

Part II. Problems. Show work**.** Generous partial credit will be awarded for relevant fragments, but not when the fragment is buried in irrelevancies. **If information is insufficient,** write down a reasonable assumption and proceed to answer the question. Points as marked.
1. There are six firms in industry A. The largest has $50 million in revenue, and each of the others has $10 million. Industry B has four firms, each with sales of $40 million. Compute FFI=C4 and HHI for each industry. Which industry is more competitive? (5 pts)
2. You own a firm with only one significant rival. If both firms advertise, each will earn $5 million in annual profits. If neither advertises, each firm will earn $10 million. However, if one firm advertises and the other does not, the firm that advertises will earn $15 million and the non advertising firm will earn $1 million.
    a. Suppose you plan to leave the industry next year (and your rival is aware of your plan). Should you advertise? What profits do you expect? (3pts)
    b. Suppose instead that your rival has announced plans to retire in 5 years, and then to sell to a conglomerate firm that likes to advertise. What is your advertising plan and expected profits over the next 5 years? (3pts)
    c. Now suppose that you plan to hand your business down to your children, and this "bequest" goes on forever. Your rival has similar plans. What is your advertising choice and expected profits in this case? (4pts)
3. In Gelato, Massachusetts, the market for compact discs has evolved as follows. There are two firms that each use a billboard to post the price they charge for compact discs. Each firm buys CDs from the same supplier at a cost of $5.00 per disc. The inverse market demand in their area is given by $P = 10 - 2Q$, where Q is the total output produced by the two firms. Almost all customers purchase from the firm charging the lower price.
    a. Describe each firm's best response to what the other firm posts on its billboard. (2pts)
    b. What outcome (prices, quantities and profits) do you predict? (2pts)
    c. How (i.e., in which direction) would your answers change if the products were not perfect substitutes? (3pts)
4. You are the manager of a firm that produces output in two plants. The inverse demand for your firm's product is P = 78 - 15Q, where $Q = Q_1 + Q_2$. The marginal cost associated with producing in the two plants are $MC_1 = 3Q_1$ and $MC_2 = 2Q_2$.
    a. How much output should be produced in plant 1 in order to maximize profits? (4pts)
    b. Find the profit maximizing output at the other plant, and the resulting price and profit. (4pts)