Strategic Behavior:

Question 1.
Suppose two firms, 1 and 2, face demands $x1=a1-b1\ p1+ d\ p2$ and $x2=a2-b2\ p2 + d\ p1$ where $a1>0, a2>0, b1>0, b2>0, d>0$. Consider that both firm's marginal costs are constant and equal to c. Consider firm 1 is an incumbent and firm 2 is a potential entrant. Firm 2 has fixed costs F and firm 1 has sunk costs F. Suppose that if firm 2 enters they compete as Nash-Bertrand.

(i) Are the products substitutes?

(ii) What is the Nash equilibrium in prices?

(iii) What is the limit price that firm 1 can charge to deter entry?

(iv) How does the limit price depend on d? What is the intuition?

Question 2.

Suppose two firms are Cournot competitors. Inverse demand is $P = 10-Q$. Firm 1's costs are $C1(q1) = (5 - k1)q1 + k1^2$, and firm 2's costs are $C2(q2) = 5q2$, where $q1$ and $q2$ are firm 1 and firm 2's outputs, respectively, and $k1$ is a sunk investment that firm 1 can make to lower its marginal cost. In a first period, firm 1 chooses $k1$. In the second period, firm 2 observes $k1$ and makes its entry decision. If it enters, then firms simultaneously compete.

What is firm 1's strategy if it wants to deter entry?

Vertical Relationships

Question 3.

Multiple dealerships with exclusive territories is the focus of this exercise. Suppose there is a single manufacturer of a certain good that has marginal cost of production c and sells the good to N dealers at the same wholesale price w. These N dealers then distribute the product and sell it to final consumers at price p and provide services, s, that increase the sales of the product. Each of these distributors is an exclusive dealer over a certain territory and faces a local demand $q=(a-bp)\, s^d$, where a, b and d are demand parameters that are identical to all retailers and $0<d<1$.

Suppose retailers choose p and s to maximize their profits. Each unit of services provided costs them $1. The dealers have no additional costs other than the service costs and the wholesale price they have to pay to the manufacturer.

(i) What level of s and p does each retailer choose given w?

(ii) What w does the manufacturer chose for d=1/2?

(iii) For general d, please show how the optimal w changes with increases in d? (Hint. From the manufacturing profit maximizing FOC you get optimal w as a function of d…)

Question 4.

(i) Franchises, such as McDonalds, have outlets spread over a wide geographical area. The franchise owns typically some of the outlets, where the manager is just a salaried employee. The remainder outlets are owned by the franchisees. They pay the franchiser a fixed proportion of revenues and also a fixed fee regardless of revenues, in return for the privilege of using the franchise's name. Explain the variation in ownership structure.

(ii) A contract with a new franchisee specifies that the latter has to buy a huge neon sign with the logo of the franchise. The neon sign is very expensive. Explain what happens to the optimal franchise fee? Explain why such a requirement (neon sign as a clause in contract) may be optimal for the franchiser?