SØK1011 - EXAM

Total points = 36 points.

Question 1 (4 points)

A monopolist with constant marginal cost faces a market demand curve given by:

where is the market price and is the market quantity.

Find the monopolist optimal supply and the market price.

Question 2 (8 points)

Firm A and firm B compete in the market for bottled water. Both firms have the same constant marginal cost . The market demand curve is:

where is the market price, is the market quantity. The market quantity is the sum of the two firm supplies: .

a) (4 points) Find the equilibrium price and the supplies of the two firms if they compete by setting prices (Bertrand competition).

b) (4 points) Find the equilibrium price and the supplies of the two firms if they compete by setting quantities (Cournot competition).

Question 3 (4 points)

The government is considering the adoption of a quota system for regulating the greenhouse gas emissions of a newly developed industry. Let denote the industry’s output. The market marginal willingness to pay (or marginal benefit) is . The market marginal private cost is: . The industry’s greenhouse gas emissions cause a total externality cost equal to . Assume that producing 1 unit of output results in 1 ton of greenhouse gas emissions and that companies must hold one quota for each ton of greenhouse gas they emit.

Find how many quotas should the government issue in total and the equilibrium price for one quota.

Question 4 (8 points)

Wind farm A causes a negative externality on town B. The profits of the wind farm are given by:

where denotes the level of output of the wind farm.

The externality on town B is measured by:

Assume that the wind farm has the property rights.

a) (2 points) Find the level of if A and B do not coordinate.

b) (2 points) Find the level of if A and B coordinate.

c) (4 points) Does coordination increase social welfare? Briefly explain.

Yes, if there are no transaction costs (Coase theorem). The total payoffs are higher under coordination (0.125 instead of 0). Then B can make a transfer to A (between 0.125 and 0.25) and the outcome will Pareto dominate the uncoordinated solution.

Question 5 (6 points)

Discuss the meaning of price discrimination and how price discrimination affects social welfare.

Price discrimination = selling the same product at different prices.

First-degree = different prices for different units and different people. Price for each unit equal to the marginal WTP of the buyer. It increases social welfare compared to a single monopoly price, but all the surplus is appropriated by the seller.

Second-degree = different price for different units but everyone who buys the same amount pays the same price. It is inefficient because the seller prefers restricting the quantity offered to the consumer type with the smaller WTP. It may be less inefficient than a single monopoly price.

Third-degree = different prices for different people but every unit sold to the same person has the same price. It is inefficient, but whether is better than a single monopoly price is ambiguous. It may be more inefficient because price should be the same across consumers. However, it may be more efficient if one type of consumer would be excluded with a single price.

Question 6 (6 points)

Discuss what are the externalities of innovation (defined as a firm's adoption of new technology).

Positive externalities:

1) lower costs => lower prices => higher demand => increase in consumer surplus

2) knowledge spillover: other companies will also improve their technology and thus lower prices

Negative externalities:

Under imperfect competition, some innovations may be used to steal market power from competitors, thus increasing the innovator’s profits more than the increase in total surplus.