

Homework 18

Due March 20, 2018

Homework must be on the front desk at K9 by 15:10. Papers turned in from 15:11 till 15:40 will be accepted at a penalty of 5 points. Submissions at any other time or manner will be ignored. Any paper which does not look as if it came from a student of a world-class institution (not clean, illegible, unnamed, unstapled, unlabelled tasks, final results not in boxes etc.) will be penalized with up to 50 points at the discretion of the grader. Cheating in homework is a serious offense and it will be prosecuted with consequences beyond the credit of this assignment.

Both questions are revising questions based on already taught material.

1. Merlin Corp. is a monopoly in the high-speed computer market. The firm has recently introduced a new quantum computer unit that will be offered for leasing to all (identical) satellite installations around the world. Merlin's managers have been debating whether to use a single hourly rental charge or a 2-part tariff of an 'access charge' plus an hourly rental rate. Merlin's economists assumed a linear demand and estimated a marginal revenue curve $MR = 45 - 0.05Q$ per potential user, where P is the per hour price of computer time and Q is the number of hours of computer time leased per month. They have also estimated the marginal cost at \$30 per hour.
 - (a) Assuming that Merlin chooses to set a single price, what will the firm's price and output be? [15p]
 - (b) Assuming that Merlin uses a 2-part tariff, what 'access charge' and hourly rental fee should the firm set? Compare the firm's revenues under the options in (a) and (b). [15p]
 - (c) Explain how heterogeneous demand curves among the installations would alter the 2-part tariff. [10p]

2. A manufacturer whose marginal cost is $c = 6$ sells his product to two retailers who play a two stage game. First, the retailers simultaneously and independently decide whether or not to launch an advertising campaign. If at least one retailer pays for the advertising campaign, market demand is $p = 24 - Q$, where Q denotes total quantity in the market. If neither one launches the advertising campaign, demand is $p = 15 - Q$. The advertising campaign costs $S = 28$. The manufacturer cannot launch the advertising campaign himself and cannot force the retailers to pay for it. In the second stage, given the realized demand, the retailers simultaneously and independently choose quantities. Each retailer gets the product from the manufacturer at the per unit price $r = 6$ and also pays a fixed franchise fee equal to T .
 - (a) What are the retailers' equilibrium profits if both pay S , if one of them pays S and if neither of them pays S ? Is the advertising campaign launched at Nash equilibrium? What is the maximum franchise fee that the manufacturer can extract from the two retailers? [25p]
 - (b) Suppose the manufacturer can impose RPM on each retailer, forcing them to sell at $p^* = 15$, so that each retailer will serve half of the market. What are the retailers' equilibrium profits if both pay S , if one of them pays S and if neither of them pays S ? Is the advertising campaign launched at the Nash equilibrium? What is the maximum franchise fee that the manufacturer can extract from the two retailers? [25p]
 - (c) Compare the manufacturer's profit in (a) and (b) and explain the economic reason for the difference. [10p]

Estimated completion time: 100 min

Difficulty level (normalized to UoL standards): 1. 5/5 2. 5/5