

# Homework 11

## Due January 30, 2017

Homework will be collected at the end of the lecture on the day it is due. Submissions in any other time or manner will be ignored. The maximum score is 100. Unprofessionally looking papers or unnamed or unstapled sheets or improperly labelled questions or bad handwriting will result to a penalty up to 50% at the discretion of the grader. Plagiarism will be prosecuted and perpetrators will be taken to room 3401 for a visit.

1. A monopolistic firm with total costs  $TC = 20 + 2Q$ , where  $Q$  denotes total output, sells its product to two types of customers: business customers with demand  $Q_B = 14 - p$  and other customers with demand  $Q_O = 5 - 0.5p$ .
  - (a) If the monopolist can apply third-degree price discrimination, find the equilibrium quantities, prices, profit and consumer surpluses. [20p]
  - (b) Explain how a ban on price discrimination would affect the consumer surpluses and the monopolist's profit. [10p]
  
2. A monopolist with zero MC sells to two separated markets, E and W, with demands  $P_E = E - q_E$  and  $P_W = W - kq_W$ .
  - (a) Find the quantities, the prices, the DWL and the profit in each market, if the monopolist uses third-degree price discrimination. [20p]
  - (b) Assume that the law prohibits setting different prices in the two markets. If  $W > E$ , will the firm choose to serve one or both markets? What will happen to DWL? [20p]
  - (c) Assume that firm's costs have changed and now the cost function is  $0.5\beta Q^2$ . What are the equilibrium quantities for both markets if the monopolist can use third-degree price discrimination? If  $W > E$ , plot a graph showing the combinations of  $(E, W)$  in  $(E, W)$  space such that the monopoly serves both markets. Hint: quantities cannot be negative; realized profit is possible to be negative. [30p]