

Operations Research

Homework 11

Due in class Wednesday, December 7, 2016

1. (*From HL, Exercise 19.3-4.*) The Blue Cab Company is the primary taxi company in the city of Maintown. It uses gasoline at the rate of 8 500 gallons per month. Because this is such a major cost, the company has made a special arrangement with the Amicable Petroleum Company to purchase a huge quantity of gasoline at a reduced price of \$1.05 per gallon every few months. The cost of arranging for each order, including placing the gasoline into storage, is \$1 000. The cost of holding the gasoline in storage is estimated to be \$0.01 per gallon per month.

Use the EOQ model to find the optimal order quantity.

2. (*HL, Exercise 19.3-14.*) In the basic EOQ model, suppose the stock is replenished uniformly (rather than instantaneously) at the rate of b items per unit time until the order quantity Q is fulfilled. Withdrawals from the inventory are made at the rate of d items per unit time, where $d < b$. Replenishments and withdrawals of the inventory are made simultaneously.
 - (a) Find the total cost per unit time in terms of the setup cost K , production quantity Q , unit cost c , holding cost h per unit per time, withdrawal rate d , and replenishment rate b .
 - (b) Determine the economic order quantity Q^* .