

ISyE 3104 - Homework 8
Due: October 27, 2005
(25 points)

A high-tech manufacturing company in Hong Kong called HK is purchasing color displays to be used in its digital video recorders. The displays are coming from north of China and it takes 3 weeks to receive any order from the vendor. The weekly demand of displays is approximately normally distributed with mean of 38 and a variance of 130. Each display costs \$18.80 and there is an ordering cost of \$75 regardless of the size of the order. The company uses a stock-out cost of \$400 per display and 40% of annual interest rate is used to compute holding costs. HK works 52 weeks in a year.

- a. (3 points) Compute the mean and variance of demand during lead time.
- b. (2 points) HK currently orders in lots of 500 units. What should be the reorder point in this case?
- c. (6 points) If HK wants to rearrange the contract with the vendor to minimize costs, what should be the new order size?
 - i. What is the corresponding optimal reorder point? (Do at most two iterations to find the optimal Q,R values)
 - ii. What is the safety stock level corresponding to the (Q,R) policy you found in part (i)?
- d. (2 points) How much can HK save in terms of setup, holding and stock-out costs by changing the contract from 500 units of lot size to the optimal value you found in part (c)? (you should use the best R values you found for the corresponding Q values)
- e. (4 points) HK's management is uncomfortable with the \$400 stock-out cost. Rather than using a stock-out cost, they decided to have a 92% Type 1 service level ($\alpha = 0.92$). If HK uses a lot size equal to EOQ:
 - i. What is the reorder point?
 - ii. What is the corresponding imputed shortage cost?
- f. (8 points) Solve part (e) for Type 2 service level ($\beta = 0.98$) instead of Type 1.
 - i. Find the optimum values of Q and R. (Do at most two iterations.)
 - ii. Compute the imputed shortage cost for (ii).
 - iii. What is the corresponding Type 1 service level?