

Homework #10
Supply Chain Models: Manufacturing & Warehousing (ISyE 3104) – Spring 2002
Due March 28, 2002,

Show all your steps to get partial or full credit. Total 45 points.

Question 1

Jeremy, the office manager of The Technique, stocks replacement toner cartridges for laser printers. Demand for cartridges is approximately 30 per year and is quite variable (which can be represented using the normal distribution with standard deviation of 6) Cartridges cost \$100 each and require 1 month to obtain from the vendor. Placing an order costs \$40. Holding cost is calculated based on an annual interest rate of 12%.

In calculating the ordering/inventory policy, Jeremy decided to use a 95 % service objective.

- a) (10 points) Find the optimal policy based on Type 1 service.
- b) (7 points) What is the type 2 service level that corresponds to the policy you found in part (a)? Find the imputed shortage cost associated with this policy.
- c) (11 points) Find the optimal policy based on Type 2 service.
- d) (7 points) What is the Type 1 service level that corresponds to the policy you found in part (d)? Find the imputed shortage cost associated with this policy.

Question 2

A particular component, part C, is used in two final products, A and B. It takes only one part C to make a unit of product A. However, each product B requires 3 Cs. Plans call for starting 100 units of part type A into production each week. Planned order releases over the next four weeks for part type B are 50, 0, 60 and 30 units, respectively. In addition, spare-part demand for part C is estimated at 75 units per period.

(10 points) Current inventory for part C is 10. The plant expects to receive 5 units of part C in week 1, and another 5 units in week 2. Find the net requirements for part type C.