ESCUELA SUPERIOR POLITECNICA DEL LITORAL

Administracíon de Operaciones
Primer Parcial
Term. 1, 2017

1.) Barbara Bright is the purchasing agent for West Valve Company. West Valve sells industrial valves and fluid control devices. One of the most popular valves is the Western, which has an annual demand of 4,000 units. The cost of each valve is $90, and the inventory carrying cost is estimated to be 10% of the cost of each valve. Barbara has made a study of the costs involved in placing an order for any of the valves that West Valve stocks, and she has concluded that the average ordering cost is $25 per order. Furthermore, it takes about two weeks for an order to arrive from the supplier, and during this time the demand per week for West valves is approximately 80.

(a) What is the EOQ?
(b) What is the ROP?
(c) What is the average inventory? What is the annual holding cost?
(d) How many orders per year would be placed? What is the annual ordering cost?
(e) Given the EOQ, what is the total annual inventory cost (including purchase cost)?
(f) What is the time between orders?

2.) The Vision3000 Television Network gets an average of $400,000 when they broadcast a successful show and it loses an average of $300,000 when the show is not sucessful. Of all of the shows on the network, 25% have been successful and 75% have failed. A market research company can be hired to do a public survey of a proposed show in order to predict the show's success or failure for a cost of $40,000. Given that a show will be a success, there is a 90% chance that the survey predicts it will be a success. Given that a will be a failure, there is 80% chance that the survey predicts it will be a failure. Using a decision tree, determine the best strategy for the Vision3000 Television Network to maximize their profits.

3.- A large department store operates 7 days a week. The manager estimates that the minimum number of salespersons required to provide prompt service is 12 for Monday, 18 for Tuesday, 20 for Wednesday, 28 for Thursday, 32 for Friday, and 40 for each of Saturday and Sunday. Each salesperson works 5 days a week, with the two consecutive off-days staggered throughout the week. For example, if 10 salespersons start on Monday, two can take their off-days on Tuesday and Wednesday, five on Wednesday and Thursday, and three on Saturday and Sunday. Formulate the linear programming problem to determine how many salespersons should be contracted and how their off-days should be allocated (you do not need to solve the problem, only set it up correctly).