

Exam 01A-SCM 386-Semester II 201718

- Use a excel spreadsheet to answer all questions (Sheet 1 for Question 1, Sheet 2 for Question 2 and Sheet 3 for Question 3)
- Problem 1 does not require the use of Solver but you need to show all your work.
- Make sure your objective function and constraints are clearly defined (Problems 2 & 3).
- Make sure that the solver parameters window include all the appropriate inputs (Problems 2 & 3).
- Submit your exam through ACE as a SINGLE FILE. CELL PHONES ARE PROHIBITED DEVICES DURING THE TEST.

1. Management of Toys R4U Company needs to decide whether to introduce a certain new novelty toy for the upcoming Christmas season, after which it would be discontinued. The total cost required to produce and market this toy would be \$500,000 plus \$15 per toy produced. The company would receive revenue of \$35 for each toy sold.
 - a. How many units must they sell to break even? SHOW ALL YOUR WORK. (15 PTS)
 - b. A sales forecast has been obtained that indicates that 40,000 units of the new toy could be sold. How large can the variable cost be before this new product ceases to be profitable? SHOW ALL YOUR WORK. (15 PTS)

2.

Minimize Cost = $40x + 50y$

Subject to

$$2x + 3y \leq 50$$

$$x + y \geq 12$$

$$2x + y \geq 20$$

$$x, y \geq 0$$

- a. Use solver to minimize the problem. Your solution should be clearly defined (15 PTS).
 - b. For each constraint define whether slack or surplus is more appropriate and then calculate its value (15 PTS)
3. Winkler Furniture manufactures two different types of china cabinets: a French Provincial model and a Danish Modern model. Each cabinet produced must go through three departments: carpentry, painting and finishing. The following table contains all relevant information concerning production times per cabinet produced and production capacities for each operation per day, along with net revenue per unit produced. The firm has a contract with an Indiana distributor to produce a minimum of 300 of each cabinet per week (or 60 cabinets per day). Owner Bob Winkler would like to determine a product mix to maximize his daily revenue.

Cabinet Style	Carpentry (Hous/Cabinet)	Painting (Hous/Cabinet)	Finishing (Hous/Cabinet)	NetRevenue/Cabinet (\$)
French Provincial	3	1.5	0.75	28
Danish Modern	2	1	0.75	25
Department Capacity(hours)	360	200	125	

- a. Solve the problem in a excel spreadsheet (note: make sure that solver parameters window includes all the appropriate inputs) (20 PTS)
- b. Include the Sensitivity Analysis and explain in your own words all the information that is presented on the chart titled "Variable Cells" (10 PTS)
- c. Explain in your own words all the information that is presented on the chart titled "Constraints" (10 PTS)

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