

ISyE 3104 - Homework 2
Due: September 8, 2005
(25 points)

1. **(10 Points)** Read the article “Inventory Transformation” and answer the following questions:
 - a. **Before Transformation**
 - i. Explain how the objectives of “maximizing labor efficiencies” and “minimizing cost” impacted Revlon's overall efficiency and profitability? Why do you think the company chose these objectives?
 - ii. How did Revlon incorporate demand, safety stock, and supplier lead time information into its planning process? Do you see any problems with their approach?
 - b. **During Transformation**
 - i. What kind of data did Revlon need for inventory planning? Did they have easy access to all the data they needed? Explain.
 - c. **After Transformation**
 - i. What did Revlon do to ensure that the transformation would be sustained? (Summarize in 2-3 sentences.)
 - ii. Among the seven lessons learned from this project, select one of the lessons that you already got from your own experiences (in your internships or daily lives). Explain how you learned that lesson yourself? Explain your story in a paragraph.

2. **(4 Points)** Read the article “Managerial Perspective on Aggregate Planning”.
 - a. How many companies are considered in this study?
 - b. According to the study which methodology is mostly used in production planning? Do you agree with the authors’ explanation?
 - c. Give one important factor that affects planning emphasized by the paper but not by the text.
 - d. Give one reason as to why the “aggregate planning” is not very popular in practice.

3. **(11 Points)** SCL Manufacturing is a hardwood table manufacturing company which operates in a build-to-order mode. SCL is doing business for many different companies. The demand from these companies for tables change over months, however it is very well predictable due to the planning and experience of the SCL’s market experts. The aggregated forecasts of the tables are tabulated below for the upcoming 5 months. SCL leases special machines to be used in the manufacturing. These machines can be used in any of the orders but they have limited processing capabilities of 120 hours per month as a requirement of the lease. Moreover, due to the preventive maintenance schedules, the productivity of these machines will vary each month (90% productivity means only 90% of lease hours are available for projects that month). The data is tabulated below. Each machine can produce 1 table in 1 hour and each of these machines needs to be set

up in their special locations, where the setup cost is \$2,000 per machine paid to the leasing company. At the end of each month SCL either leases new machines as needed or asks the leasing company to uninstall the excess machines at a lease cancellation fee of \$2,500 per machine so that SCL won't pay high monthly lease for unused machines. Therefore, SCL tries to minimize the number of unused machines while meeting the demands on time. Currently (at the end of August 2005) SCL has no inventory of tables. The inventory holding cost of one table is \$75 per month.

Month	Productivity Level (%)	Aggregated Table Forecast
September 2005	95%	1,578
October 2005	91%	3,524
November 2005	85%	6,856
December 2005	89%	5,311
January 2006	93%	2,956

- a. (4 points) Now (at the end of August 2005) SCL has 10 machines.
 - i. Find the 5 month leasing / uninstalling plan of machines for SCL under the zero-inventory policy.
 - ii. Calculate the total cost of this plan.
 - iii. If SCL sells the tables at \$100 per table to companies, what is the total profit at the end of January 2006 assuming a zero balance at the beginning of September 2005?
- b. (4 points) Suppose that now SCL wants to make a one-time lease of machines and keep the number of machines constant until the end of January 2006 (constant workforce policy). Assuming again 10 machines in hand at the beginning:
 - i. What is the number of machines to be used in the next 5 months?
 - ii. What is the total cost of this policy to SCL?
 - iii. What is the profit at the end of January 2006 with \$100 per table payment from companies?
- c. (3 points) Which policy should SCL choose considering cost, inventory, and profits? Discuss the two policies' advantages and disadvantages.