**IMSE 802 Supply Chain Operations and Decision Making**

**Homework 1**

**Summer 2018**

1. (5 points) Discuss why the supply chain is important to a company’s business strategy.
2. (5 points) Given the following monthly sales data, use exponential smoothing to forecast sales through July 2019. Test smoothing constants of 0.2, 0.4, 0.6 and 0.8. Graph the results. Which smoothing constant would you use and why?

|  |  |  |
| --- | --- | --- |
| Month | Actual | Forecast |
| Jul-18 | 14520 | 14000 |
| Aug-18 | 17250 |  |
| Sep-18 | 16800 |  |
| Oct-18 | 19500 |  |
| Nov-18 | 21000 |  |
| Dec-18 | 22500 |  |
| Jan-19 | 19500 |  |
| Feb-19 | 16800 |  |
| Mar-19 | 15500 |  |
| Apr-19 | 14244 |  |
| May-19 | 13533 |  |
| Jun-19 | 13880 |  |
| Jul-19 |  |  |

1. (5 points) Use the actual data is question 2 above for July 2018 through June 2019. Compute the safety stock level for a 90% service level. The lead time for receiving an order after it is placed is 10 days. Compute the reorder point with safety stock.
2. (5 points) Your company is producing three products, Product 1, Product 2 and Product 3. The profit for each of these items is $80, $110 and $180, respectively. The following resource utilization and availability table is given below. How many of each product will you produce? What is your total profit?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Resources Required per Unit** | | | **Available** | **Units** |
|  | **Product 1** | **Product 2** | **Product 3** |  |  |
| **Electronics** | 1 | 1 | 1.25 | 200 | kit |
| **Plastics** | 0.5 | 1.25 | 1.25 | 185 | lbs |
| **Production** | 1 | 3 | 2 | 625 | hours |
| **Assembly** | 1.5 | 2.5 | 3.5 | 440 | hours |

1. (5 points) Describe benchmarking. Define the seven steps to successful benchmarking (WERC). One of the popular WERC metrics is “Dock to Stock Cycle Time, in Hours ‐ Inbound Operations.” Your company’s current Dock to Stock Cycle Time is 8 hours. How well is your company performing based on the available WERC metrics? Discuss one thing you might do to improve this operation.

precisely