OMGT6743 Exam I

Please complete the following exam. Read all instructions carefully and answer each question asked. Calculations are important but so are explanations and dialogue.

1. You are required to turn in this exam by the due date on the course website. Late papers will not be accepted.

2. Your work should consist of:

   a. A cover sheet with your name and the date.

   b. A **1-PAGE** Executive Summary of your work including explanations, calculations, diagrams, etc. Please feel free to include as much detail as you think necessary but remember you have limited space.

   c. Executive summaries are expected to be typewritten (i.e., MS-Word, WordPerfect). However, calculations can be handwritten. Clarity and neatness are expected.

   d. Please refer to the **website for further information regarding writing executive summaries.** You may use any font and spacing that is reasonable. i.e., 0.25-inch margins and font size 10 are at the low end of reasonable. Remember you are presenting this to your boss.

   e. Please attach all calculations, spreadsheets, diagrams, graphs, etc., to the end/back of the executive summary and label the section Appendix A. You can also use an XL workbook as your appendix. If you are running short on space in your executive summary, you may reference pages in the Appendix. (This may come in handy for certain diagrams, graphs, etc.)

3. You will be graded on both your calculations and your presentation. Calculations will be weighted approximately 75% and presentation (i.e., the executive summary) will be weighted 25%. Just a reminder, if I can't read it or find it, I can't grade it.

A typical exam will have the following parts:

- a cover page with your name and date,
- your executive summary,
- an appendix cover page, and
- your appendix pages (either in Word or Excel).

You may turn in both a Word file and an Excel file (the Excel file would most likely contain your Appendix material).

NOTE: I WANT ONLY 1 (ONE) EXECUTIVE SUMMARY THAT INCLUDES ALL EXAM PROBLEMS. DO NOT CREATE MORE THAN 1 (ONE) EXECUTIVE SUMMARY!! PLEASE EMAIL ME IF THIS IS NOT CLEAR.

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Clem's Convoluted Contingency

Clem's new position included a bit of everything. She had to forecast, plan for production, master schedule, and give recommendations. This is her latest challenge and she needs your help.

Finicky Forecasting Fusillade

Clem was able to find the past 12 years of data on sales and believes she can create a forecast for the upcoming period of demand.

Year	Demand	Year	Demand
1	120,000	7	122,000
2	115,000	8	125,000
3	119,000	9	121,000
4	117,000	10	120,000
5	122,000	11	115,000
6	132,000	12	125,000

She believes a three-year moving average or a five-year moving average may help forecast the next period's demand. The method they use now is the latest period or naïve method. Help Clem develop a forecast for the next year using a latest period/naïve model, a three-year moving average, and a five-year moving average. She must show which model is producing the best forecast of the three models. So assist her in calculating the MAD for each model, comparing those MAD #'s, recommending the "best" final model, & stating the year 13 forecast to be used moving forward.

Production Planning Polemic

Clem has been asked to provide a "rough-cut" aggregate production plan. In developing an aggregate production plan, Schlaper Inc. generally takes a yearly forecast and spreads it out over four quarters. Clem knows that quarterly demand is seasonal and historically follows the ratios shown in Table 1.1. She also knows the following details about the production process (refer to Table 1.1).

Table 1.1 Aggregate Production Plan Information

Workers on staff now = 0
Cost to hire a new worker = $300
Cost to layoff a worker = $500
Quarterly maximum capacity = 50,500 units
Productivity per worker = 100 units per worker/quarter
Inventory costs = $4.5 per unit per quarter

Quarterly Demand Ratio
Q1 = 1/6
Q2 = 3/10
Q3 = 1/5
Q4 = 1/3

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Clem knows she cannot subcontract work; she cannot have workers work overtime, or let orders go unfilled. In addition, idle workers must be laid off, new workers generally pick up how to complete the tasks quickly, training costs tend to be negligible, the amount of days worked is the same per quarter, and any workers left after the fourth quarter will be retained. Use the forecast you came up with earlier as the yearly demand and then use the ratios in Table 1.1 to spread the demand over 4 quarters to begin the Aggregate Production Planning Process.

Choices, Choices, Choices: Level, Chase, Hybrid

Clem's boss wants to produce units at a constant rate over each quarter, as he believes this helps keep costs low (i.e., a pure level strategy). However, Clem believes it would be more advantageous with regard to total cost to follow a pure chase strategy. She needs to identify which, if either, of the strategies are feasible and would produce the lowest total cost.

She also wishes to know if there exists a hybrid strategy that outperforms (provides lower total costs) either the pure chase or pure level strategy and what that hybrid strategy would be. Complete the Level, Chase and Hybrid APP's and compare the Level, Chase, and Hybrid plans on total cost, inventory cost, and hiring/layoff costs. She needs to speak to the tradeoffs between the plans and why her final choice is considered the "best".

Figures 1.1, 1.2, and 1.3 provide APP templates to assist in creating the APPs or you can use the APP XL templates provided on the course website.

Martin's Master Malversation

After Clem works out a suitable APP, she hands her best plan off to Martin. Martin must then create a master production schedule (MPS) for the two product lines. He has the following information, Table 1.2, on each of the product lines based on quarterly demand. In addition, he knows that the demand for the two types of units is evenly distributed over each month. Help Martin create an MPS for the two product lines. Briefly comment on how total monthly MPS numbers (e.g., the sum of Prod. 1 & Prod. 2 for M1 versus M2, etc.) change.

Table 1.2 Product Line Type Information

Product Type	% Demand of Quarterly Demand
Prod. 1	40%
Prod. 2	60%

Help Martin create the two master schedules with the information given. Figures 1.4 & 1.5 provide MPS templates to assist in developing the master schedules or you can use the MPS XL templates provided on the course website. Just be sure to use the Q1-Q4 APP Demand #'s you developed earlier

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Just the Facts

For the record, an executive summary detailing all the work that Clem has completed as well as the work Martin has added must be created. At a minimum these areas that must be covered:

- the three forecasting models, the models MAD measurements, & subsequent recommendations,

- the three APP models,
    - discuss ads/disads of a level strategy vs. a chase strategy vs. a hybrid strategy,
    - compare the tradeoffs between inventory & labor (hiring/firing), and cost,
    - describe what a hybrid strategy is and its advantages/disadvantages
    - give final recommendations on what the "best" APP is

- the master production schedules for the two product lines that were developed & how the #'s change as the quarters progress (i.e., how does Q1 differ from Q2 & Q3, etc.)

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Figure 1.1 Aggregate Production Plan Using a Pure Level Strategy

AGGREGATE PRODUCTIN PLANNING – LEVEL STRATEGY

				Prod./Wrkr =	Hire Cost =	Fire Cost =			
Level	Begin Wrks =0			100	300	500		inv. Cst =	4.5
	Needed	Produced	Act. Produced	Wrks Nd'd	Hire	Fire	Ttl Wrks	End Inv.	Inv. Cst
Q1									
Q2									
Q3									
Q4									
Totals				Hire/Fire Costs =				Total Inv. Cost =	
							Level Plan	Total Cost =	

Figure 1.2 Aggregate Production Plan Using a Pure Chase Strategy

AGGREGATE PRODUCTIN PLANNING – CHASE STRATEGY

				Prod./Wrkr =	Hire Cost =	Fire Cost =			
Chase	Begin Wrks =0			100	300	500		inv. Cst =	4.5
	Needed	Produced	Act. Produced	Wrks Nd'd	Hire	Fire	Ttl Wrks	End Inv.	Inv. Cst
Q1									
Q2									
Q3									
Q4									
Totals				Hire/Fire Costs =				Total Inv. Cost =	
							Chase Plan	Total Cost =	

Figure 1.3 Aggregate Production Plan Using a Hybrid Strategy

AGGREGATE PRODUCTIN PLANNING – HYBRID STRATEGY

				Prod./Wrkr =	Hire Cost =	Fire Cost =			
Hybrid	Begin Wrks =0			100	300	500		inv. Cst =	4.5
	Needed	Produced	Act. Produced	Wrks Nd'd	Hire	Fire	Ttl Wrks	End Inv.	Inv. Cst
Q1									
Q2									
Q3									
Q4									
Totals				Hire/Fire Costs =				Total Inv. Cost =	
							Hybrid Plan	Total Cost =	

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Figure 1.4 MPS Template for Product Line 1

Prod. 1		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	
MPS														

Figure 1.5 MPS Template for Product Line 2

Prod. 2		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	
MPS														