

INDU 6211 – Production Systems and Inventory Control

CASE ASSIGNMENT

The case study is divided into two assignments and each assignment is to be done individually. Cooperation with others is not permitted.

Assignment 5 (15 points) - Questions 1-5 – Due on April 6, 2:00PM

Assignment 6 (20 points) - Questions 6-9 – Due on April 13, 2:00PM

For each assignment submit the following on Moodle:

1. Your MS Word file (Summary of your results and explanation of your solutions).
2. Your MS Excel file for your solution.

Moodle closes at 2:00PM and you will not be able to submit afterwards. Late assignments or assignments submitted by email will not be accepted.

CASE:

Motomaster makes two models of lawn mowers, the standard Lawn Mower 100 (part number 100) and the more powerful Lawn Mower 150 (part number 150). The following information is taken from the bill of material files for each of the lawn mowers.

Part Number	LT	Made from Part Number	Quantity per
100	2	301	2
		302	2
150	1	302	2
		304	1
301	2	302	2
		303	1
302	2		
303	1		
304	3		

Description of the Case:

The company operates one 8-hour shift a day for five days a week. However the company loses on the average 5 hours a week to unscheduled maintenance for each machine (there are multiple machines in each work center, see below). On the other hand, the company has a well trained workforce and has recently demonstrated an efficiency level of 95%.

Partially completed Master Production Schedules for Lawn Mower 100 and 150 are given below. Lawn Mower 100 and 150 are built in lots of 200 and 100, respectively.

The MRP record for 100 shows that there are 200 units scheduled to be received in week 1. None is on hand. The lead time is two weeks and it is built in lots of 200.

The MRP record for 150 shows that there are 100 units scheduled to be received in week 1. None is on hand. The lead time is one week and it is built in lots of 100.

Part 301 is a component having a lead time of two weeks, and a lot size of 600. At present there is a lot scheduled to be received in week 1 and another in week 2.

Part 302 is a component with a lead time of two weeks, and a lot size of 1500. At present there are 500 on hand and a lot to be received in week 1.

Part 303 is a component having a lead time of one week, and a lot size of 1500. At present there is a lot scheduled to be received in week 1.

Part 304 is a component having a lead time of three weeks, and a lot size of 200. At present there are 220 on hand.

Questions for assignment 5 (15 points) - Due on April 6, 2:00PM

Question 1. From the information given, draw product trees for each of the finished goods.

Question 2. Partially completed Master Production Schedule, pegged requirement file, MPS and MRP work sheets are given below. Complete the MPS, MRP and Pegging work sheets, by filling in information from what is given above, and performing the required calculations.

Question 3. It is the beginning of week 1. What exception message(s) will the computer generate? What action(s), if any, should be taken? Revise your MPS tables accordingly.

Question 4. The scheduled receipt for part 302 in week 1 has been received and is 500 units short. What parts will this affect? What action should be taken?

Question 5. A new order of 125 units for item 100 is received and the entire order needs to be sent in one shipment. How soon can this order be promised? Update your MPS table accordingly (you do not have to check the capacity again).

Questions for assignment 6 (20 points) – Due on April 13, 2:00PM

Use the original MPS tables in Question 2 in answering the questions below:

- Question 6. Perform Rough Cut Capacity Planning (RCCP) calculations by using one Resource Profile method to check the feasibility of your proposed schedules. Make specific suggestions to resolve capacity problems (if any).
- Question 7. Perform Capacity Requirements Planning (CRP) calculations to check the feasibility of your proposed schedules. Make specific suggestions to resolve each capacity problem, but do not implement the suggestions.*
- Question 8. Compare the total capacity requirements of Resource Profile and Capacity Requirements Planning methods and explain the differences.
- Question 9. In the beginning of week 1 (which corresponds to shop day 250 in the shop calendar) release the order for part 100. Calculate the finish date for this part 100 on Work Center 12 by considering the already released orders for parts 200, 250 and 300 (see below). What kind of problems do you anticipate the company will face in completing this order on time and what course of action do you suggest to resolve this issue (if any)? Comment on the reasons for such problems.

* Note: If a part is processed on the same workcenter and has lead time greater than one week, you can distribute the load evenly over the lead time.

Master Schedule

Part Number: 100
 Time Fences:
 Lot size:

Week	1	2	3	4	5	6	7	8	9	10
Forecast	100	100	100	100	100	110	300	100	200	100
Customer Orders	95	90	90	130	90	50	190	60	120	30
Projected Available Balance										
Master Production Schedule	<u>200</u>		<u>200</u>	<u>200</u>		<u>200</u>				
Available to Promise										

Master Schedule

Part Number: 150
 Time Fences:
 Lot size:

Week	1	2	3	4	5	6	7	8	9	10
Forecast	50	50	50	50	150	50	50	20	50	50
Customer Orders	45	48	48	50	120	30	35	10	25	30
Projected Available Balance										
Master Production Schedule	<u>100</u>		<u>100</u>							
Available to Promise										

MRP Record

Part Number:

Low level code:

Lot size:

Lead time:

Week		1	2	3	4	5	6	7	8	9	10
Gross Requirements											
Scheduled Receipts											
Projected Available Balance											
Net Requirements											
Planned Order Receipts											
Planned Order Release											

Pegging File

Part Number:

Week		1	2	3	4	5	6	7	8	9	10
Gross Requirements											
Part1											
Part2											
Part3											

Routing File

End Product	Lot size	Lead-time	Operation	Work-center	Std. setup hours	Std. run time hours/unit
100	200	1	1 of 2	12	1	0.25
		1	2 of 2	14	0.1	0.2
150	100	1	1 of 1	12	1	0.35
Components						
301	500	1	1 of 2	15	0.5	0.2
		1	2 of 2	16	0.5	0.12
302	1000	2	1 of 1	13	1	0.05
303	1000	1	1 of 1	15	0.5	0.05
304	1500	3	1 of 1	16	0.5	0.12

Work Center	# of Machines
12	3
13	2
14	1
15	3
16	2

Work Center 12:
 Shop Date: 250 (now) Current Time 8:00AM

DISPATCH LIST

Released Orders	Order Number	Part Number	Order Quantity	Setup Time (Hours (std))	Run Time (Hours(std)/piece)	Total Time	Quantity Completed	Load remaining	Operation Start	Operation Finish
1	121	200	75	1	0.25	19.75	25	13.5	249	251
2	123	250	50	1.25	0.50		0			
3	124	300	30	2	0.75		0			