



IE 472
Operations of Manufacturing Systems
Spring 2011
Dr Ateekh-Ur-Rehman



Date: 27-4-2011	MID TERM EXAM	Section:	Time: 1 to 3
Name:	Student ID:		

Question Number	Q1	Q2	Q3	Q4	Total
Maximum Marks	10	15	10	15	50
Obtained marks					

Question 1:

An Inventory model has the following characteristics. Annual demand is of 1000 units, ordering cost is 10SR per order, inventory holding cost per unit per year is 0.50 SR. Assume that there are 270 working days in a year.

Find economic order quantity for the inventory model?

How many orders should be placed during one year?

What is expected time between two consecutive orders?

What is total annual cost?

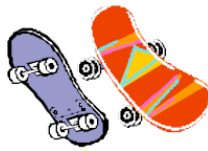
SOLUTION:

Question 2:

You are producing skateboards (item A) and each consists of one unit of board (item B), and two units of subassembly of roller-set (item C). Roller-sets are produced inside the plant, and consist of two components rollers (item D) and axles (item E).













Prepare the BOM structure and prepare the MRP tables of all items.






The weekly demand of items(A and D), the lead times for each item, The current inventory status of each item, the lot sizing rule applicable, the schedule receipts with respective due dates are as given in Table 1.



Skateboard

Table 1:

Week	1	2	3	4	5	6	7	8	9	10
A 						50				80
D 				40				60		
										
Item			A	B	C		D		E	
Lead time (weeks)			1	2	1		3		2	
Scheduled Receipts (Due Dates)										
ITEM / WEEKS	1	2	3	4	5	6	7	8	9	
 A										
 B				20						
 C			90							
 D				40						
 E										

Item	 A		 B		 C		 D		 E	
Current inventory levels	10	20	50	30	20					
Lot size	L4L	100	L4L	200	150					

SOLUTION:



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Question 3:

A print shop runs a two station binding line, in which the FIRST station punches holes in the pages and SECOND station installs binders.

On average the first station process 15,000 pages per hour, while the second station process 10,000 pages per hour.

The shop receives work requiring only punching at the rate of 5,000 pages per hour.

And the shop also receives work requiring both punching and binding at the rate of 8,000 pages per hour.

Which station is bottleneck and why?

SOLUTION:



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Question 4:

Consider the following three station production line

Station number	Number of machines	Average process time per job
1	5	15 minutes
2	12	30 minutes
3	1	3 minutes

1. Find the Bottleneck rate, raw process time and Critical WIP for the above production line?
2. Let's consider that the actual WIP level is found to be 20 jobs. Find the cycle time and throughput rate under the assumption of the best case, the worst case and the practical worst case?

SOLUTION:



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