Concept Question 1.1

Which of the following is NOT one of the benefits in MRP?

- A. improved utilization of facilities and labor
- B. increased inventory levels
- C. better response to customer orders as the result of improved adherence to schedules
- D. faster response to market changes

Concept Question 1.2

Which of the following statements is NOT true about MRP?

- A. MRP is an independent demand technique used in a production environment.
- B. MRP has evolved as the basis for Enterprise Resource Planning.
- C. MRP provides a clean structure for dependent demand.
- D. MRP uses a bill-of-material, inventory, expected receipts, and a master production schedule to determine material requirements.

Concept Question 1.3

What is an information system for identifying and planning the enterprise-wide resources needed to take, make, ship, and account for customer orders?

- A. EIS
- B. MRP
- C. ERP
- D. SCM

Concept Question 1.4

Which of the following statements is NOT true?

- A. For any product for which a schedule can be established, dependent techniques should be used.
- B. For any product, some components of that product are independent demand items.
- C. Demand for items is dependent when the relationship between the items can be determined.
- D. Less inventory frees up capital and floor space for other uses.

Concept Question 2.1

What is a list of quantities of components, ingredients, and materials required to make a product?

- A. engineering change notice
- B. master production schedule
- C. bill-of-material ✔
- D. purchase order

Concept Question 2.2

Which of the following pieces of information is NOT contained in a bill of material?

- A. physical dimensions
- B. lead times ✔
- C. quantities of components
- D. raw materials to be used

Concept Question 3.1

What is a schedule that shows when an item must be ordered from suppliers or when the production of an item must be started to satisfy demand for the finished product by a particular date?

- A. net requirements plan
- B. master production schedule
- C. lead time
- D. gross material requirements plan ✔

Concept Question 3.3

The gross material requirements plan combines

- A. a master production schedule and the net requirements plan. ✘
- B. the net requirements plan and the aggregate plan.
- C. a master production schedule and the time-phased schedule. ★
- D. the net requirements plan and the time-phased schedule.

Concept Question 4.1

Which of the following allows a segment of the master schedule to be designated as "not to be rescheduled?'

- A. time fence ✔
- B. system nervousness
- C. freeze point
- D. pegging

Concept Question 4.2

The operations manager has two important tools available to deal with MRP system nervousness. Those tools are

- A. buckets with back flush.
- B. pseudo bills and kits.
- C. net and gross requirements.
- D. time fences and pegging. ✔

Concept Question 4.3

Which of the following tools means tracing upward in the BOM from the component to the parent item?

- A. bucketing
- B. system nervousness
- C. pegging ✔
- D. time fencing

Concept Question 4.4

Which of the following is NOT true about MRP limitations?

- A. MRP does not do detailed scheduling.
- B. MRP is an excellent tool for product-focused and repetitive facilities, but it has limitations in process (make-to-order) environments.
- C. MRP is considered an infinite scheduling technique.
- D. MRP does not tell you that a job needs to be completed on a certain week or day. ✔

Concept Question 5.1

What is the lot-sizing technique that generates exactly what was required to meet the plan?

- A. lot-for-lot ✔
- B. Wagner-Whitin
- C. economic order quantity
- D. periodic order quantity

Concept Question 5.2

Which of the following lot-sizing techniques is likely to prove the most complex to use?

- A. lot-for-lot
- B. Wagner-Whitin
- C. economic order quantity (EOQ)
- D. periodic order quantity (POQ)

Concept Question 5.3

What is a lot-sizing technique that orders the quantity needed during a predetermined time between orders?

- A. part period balancing
- B. POQ
- C. EOQ
- D. Wagner-Whitin

Concept Question 5.4

Which of the following statements is NOT true about the EOQ?

- A. The EOQ is a statistical technique using averages, whereas the MRP procedure assumes known demand reflected in a master production schedule.
- B. The EOQ is preferable when dependent demand exists.
- C. The EOQ can be a reasonable lot-sizing technique when demand is relatively constant and independent.
- D. The EOQ can be used as a lot-sizing technique for MRP systems.

Concept Question 6.1

What provides feedback to the capacity plan, master production schedule, and production plan so planning can be kept valid at all times?

- A. system nervousness
- B. closed-loop MRP system
- C. lot sizing
- D. MRP II

Concept Question 6.2

What sends a lot to two different machines for the same operation?

- A. pegging
- B. lot splitting
- C. overlapping
- D. operations splitting

Concept Question 6.3

What is a report showing the resource requirements in a work center for all work currently assigned there as well as all planned and expected orders?

- A. closed-loop report
- B. pegging report
- C. MRP II report
- D. load report

Concept Question 6.4

What is the act of breaking up an order and running part of it ahead of schedule?

- A. pegging
- B. lot splitting
- C. operations splitting
- D. overlapping

Concept Question 7.1

What is a time-phased stock-replenishment plan for all levels of the supply chain?

- A. MRP II
- B. DRP
- C. MRP
- D. BOM

Concept Question 7.2

Which of the following statements is NOT true about DRP?

- A. The DRP procedure starts with the forecast at the supplier level.
- B. Effective use of DRP requires an integrated information system to rapidly convey planned order releases from one level to the next.
- C. The goal of a DRP system is small and frequent replenishment within the bounds of economical ordering and shipping.
- D. When depenent techniques are used in the supply chain, they are called distribution resource planning (DRP).

Concept Question 7.3

A bill of materials for a menu item in a restaurant is also called a

- A. recipe.
- B. food bill.
- C. bill of ingredients.
- D. product specification.

Concept Question 7.4

Which of the following statements about DRP is NOT true?

- A. Lead times are considered in DRP.
- B. DRP pushes inventory through the system.
- C. DRP stands for "distribution resource planning."
- D. DRP procedures and logic are analogous to MRP.

Concept Question 8.1

What is an information system for identifying and planning the enterprise-wide resources needed to take, make, ship, and account for customer orders?

- A. ERP
- B. CIM
- C. MRP
- D. BOM

Concept Question 8.2

Which of the following is an advantage of ERP?

- A. It is simple enough that companies have an easy time adjusting to it.
- B. It creates commonality of databases.
- C. Data fields do not have to be defined identically across the entire enterprise.
- D. It is very inexpensive to purchase.

Concept Question 8.3

Which of the following statements is NOT true regarding ERP?

- A. ERP allows companies share a common database and business practices throughout the enterprise.
- B. The objective of an ERP system is to coordinate a firm's whole business.
- C. ERP usually provides financial and human resource management information.
- D. ERP promises slow, but accurate, information.

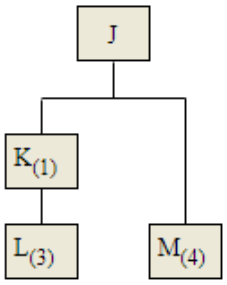
Concept Question 8.4

Supply chain management systems in the grocery industry that tie sales to buying, to inventory, to logistics, and to production are called

- A. efficient consumer response.
- B. grocery resource planning.
- C. distribution resource planning.
- D. enterprise resource planning.

Problem 14.1

You have developed the following simple product structure of items needed for your gift bag for a rush party for prospective pledges in your organization. You forecast 300 attendees. Assume that there is no inventory on hand of any of the items. Explode the bill of material. (Subscripts indicate the number of units required.)



Determine the number of units of each item required.

Item K: 300 units *(enter your response as a whole number).*

Item L: 900 units *(enter your response as a whole number).*

Item M: 1,200 units *(enter your response as a whole number).*

Problem 14.19 (additional/static)

Question Help

You need to schedule 10 units of product Alpha for delivery in 6 weeks. Three units of D and 2 units of F are required for each Alpha. The lead time for Alpha is 1 week. Lead time for D is 1 week, and lead time for F is 2 weeks.

Click the icon to view the product structure.

Click the icon to view the time-phased product structure.

Construct a net material requirements plan if there are 2 As on hand and 4 Ds *(enter your responses as whole numbers)*.

Item A

Week		1	2	3	4	5	6	7	8
Gross requirement							10		
On hand	2	2	2	2	2	2	2		
Net requirement							8		
Planned order receipt							8		
Planned order release						8			

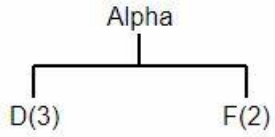
Item D

Week		1	2	3	4	5	6	7	8
Gross requirement						24	0		
On hand	4	4	4	4	4	4	0		
Net requirement						20	0		
Planned order receipt						20	0		
Planned order release					20	0	0		

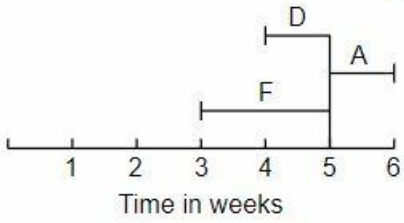
Item F

Week	1	2	3	4	5	6	7	8
Gross requirement					16	0		
On hand	0	0	0	0	0	0		
Net requirement					16	0		
Planned order receipt					16	0		
Planned order release			16	0	0	0		

The product structure.



The time-phased product structure.



For A: 10-2=8

For D: 8*3=24

For F:8*2=16

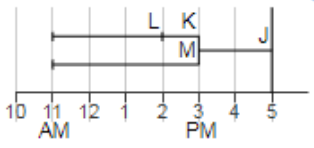
Problem 14.2

You have developed the following simple product structure of items needed for your gift bag for a rush party for prospective pledges in your organization. You forecast 200 attendees. You are expected to have the gift bags ready at 5 P.M. However, you need to personalize the items (monogrammed pens, note pads, literature from the printer, etc.). The lead time is 2 hours to assemble 200 Js once the other items are prepared. The other items will take a while as well. Given the volunteers you have, the other time estimates are item K (2 hours), item L (2 hours), and item M (4 hours). Develop a time-phased assembly plan to prepare the gift bags.

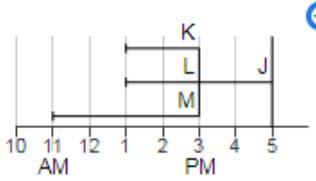
Click the icon to view the product structure.

Choose the correct time-phased assembly plan to prepare the gift bags.

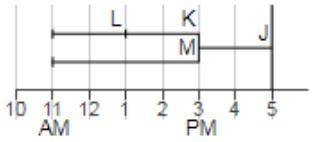
A.



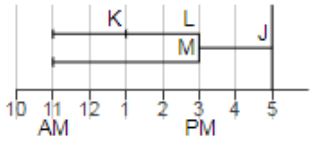
B.



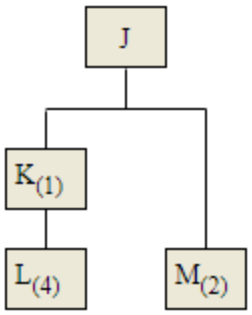
C.



D.



The product structure.

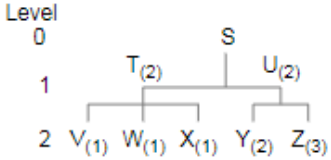


Problem 14.5

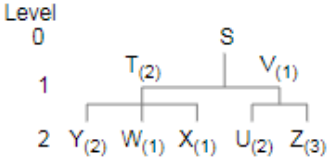
The demand for subassembly S is 100 units in week 7. Each unit of S requires 2 units of T and 2 units of U. Each unit of T requires 1 unit of V, 1 unit of W, and 1 unit of X. Finally, each unit of U requires 2 units of Y and 3 units of Z. One firm manufactures all items. It takes 2 weeks to make S, 1 week to make T, 2 weeks to make U, 2 weeks to make V, 3 weeks to make W, 2 weeks to make X, 2 weeks to make Y, and 2 weeks to make Z.

a) Choose the correct product structure.

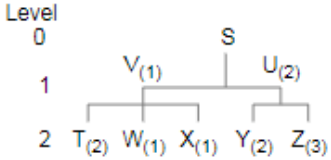
A.



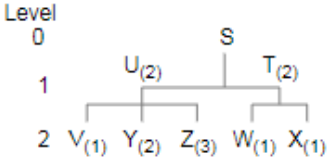
B.



C.

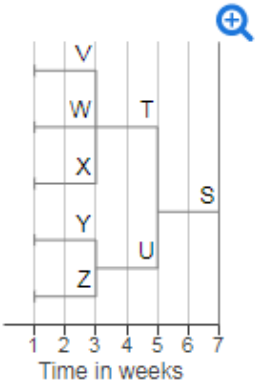


D.

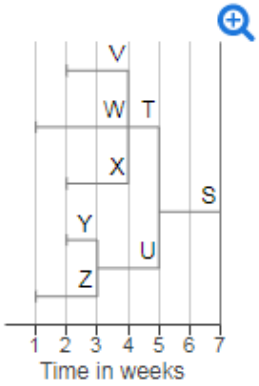


b) Choose the correct time-phased product structure.

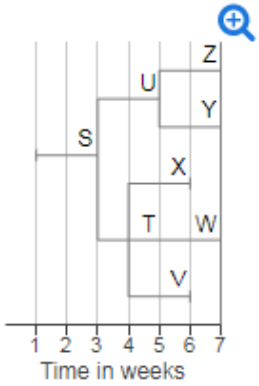
A.



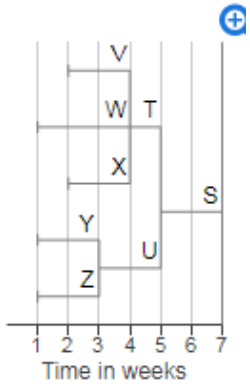
B.



C.



D.



Problem 14.6

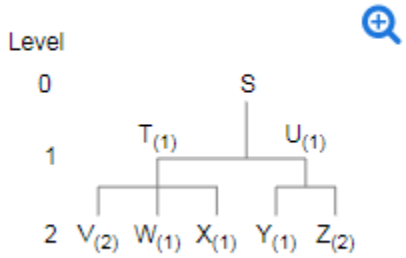
The demand for subassembly S is 150 units in week 7. Each unit of S requires 1 unit of T and 1 unit of U. Each unit of T requires 2 units of V, 1 unit of W, and 1 unit of X. Finally, each unit of U requires 1 unit of Y and 2 units of Z. One firm manufactures all items. It takes 2 weeks to make S, 1 week to make T, 2 weeks to make U, 2 weeks to make V, 3 weeks to make W, 2 weeks to make X, 2 weeks to make Y, and 1 week to make Z.

Click the icon to view the product structure and the time-phased product structure.

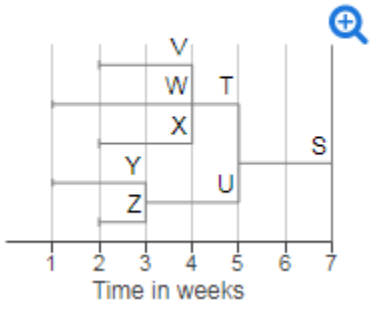
Construct a gross material requirements plan *(type 0 if the input box is not used)*.

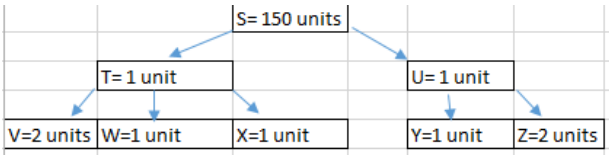
Item		Week 1	2	3	4	5	6	7	Lead Time (weeks)
S	Gross req	0	0	0	0	0	0	150	
	Order release	0	0	0	0	150	0	0	2
T	Gross req	0	0	0	0	150	0	0	
	Order release	0	0	0	150	0	0	0	1
U	Gross req	0	0	0	0	150	0	0	
	Order release	0	0	150	0	0	0	0	2
V	Gross req	0	0	0	300	0	0	0	
	Order release	0	300	0	0	0	0	0	2
W	Gross req	0	0	0	150	0	0	0	
	Order release	150	0	0	0	0	0	0	3
X	Gross req	0	0	0	150	0	0	0	
	Order release	0	150	0	0	0	0	0	2
Y	Gross req	0	0	150	0	0	0	0	
	Order release	150	0	0	0	0	0	0	2
Z	Gross req	0	0	300	0	0	0	0	
	Order release	0	300	0	0	0	0	0	1

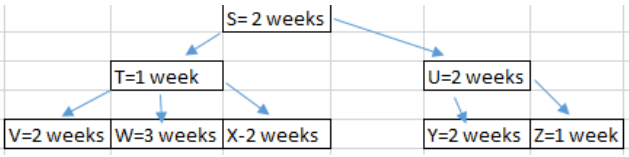
The product structure.



The time-phased product structure.







Item		1	2	3	4	5	6	7	Lead time (weeks)	
S	Gross req							**150**	2	1*150=**150**
	Order release					**150**				
T	Gross req					**150**			1	1*150=**150**
	Order release				**150**					
U	Gross req					**150**			2	1*150=**150**
	Order release			**150**						
V	Gross req				**300**				2	2*150=**300**
	Order release		**300**							
W	Gross req				**150**				3	1*150=**150**
	Order release		**150**							
X	Gross req				**150**				2	1*150=**150**
	Order release		**150**							
Y	Gross req			**150**					2	1*150=**150**
	Order release	**150**								
Z	Gross req			**300**					1	2*150=**300**
	Order release		**300**							

Problem 14.8

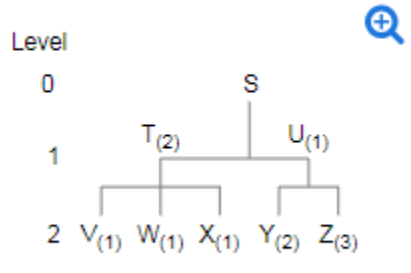
The demand for subassembly S is 100 units in week 7. Each unit of S requires 2 units of T and 1 unit of U. Each unit of T requires 1 unit of V, 1 unit of W, and 1 unit of X. Finally, each unit of U requires 2 units of Y and 3 units of Z. One firm manufactures all items. It takes 2 weeks to make S, 2 weeks to make T, 2 weeks to make U, 2 weeks to make V, 2 weeks to make W, 1 week to make X, 2 weeks to make Y, and 2 weeks to make Z.

Click the icon to view the product structure and the time-phased product structure.

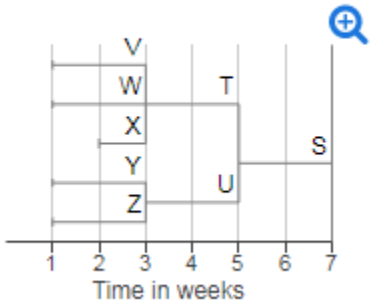
In addition to 100 units of S, there is also a demand for 30 units of U, which is a component of S. The 30 units of U are needed for maintenance purposes. These units are needed in week 6. Modify the gross material requirements plan to reflect this change *(type 0 if the input box is not used)*.

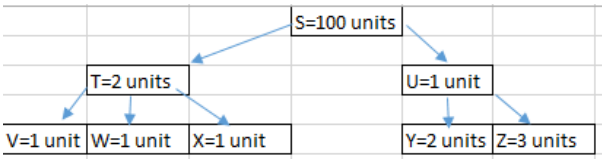
Item		Week 1	2	3	4	5	6	7	Lead Time (weeks)
S	Gross req	0	0	0	0	0	0	100	
	Order release	0	0	0	0	100	0	0	2
T	Gross req	0	0	0	0	200	0	0	
	Order release	0	0	200	0	0	0	0	2
U	Gross req	0	0	0	0	100	30	0	
	Order release	0	0	100	30	0	0	0	2
V	Gross req	0	0	200	0	0	0	0	
	Order release	200	0	0	0	0	0	0	2
W	Gross req	0	0	200	0	0	0	0	
	Order release	200	0	0	0	0	0	0	2
X	Gross req	0	0	200	0	0	0	0	
	Order release	0	200	0	0	0	0	0	1
Y	Gross req	0	0	200	60	0	0	0	
	Order release	200	60	0	0	0	0	0	2
Z	Gross req	0	0	300	90	0	0	0	
	Order release	300	90	0	0	0	0	0	2

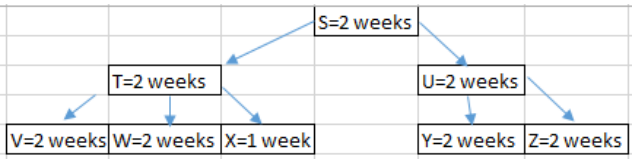
The product structure.



The time-phased product structure.







Item	1	2	3	4	5	6	7	Lead time (weeks)
S							100*1=**100**	2
					100*1=**100**			
T					100*2=**200**			2
			100*2=**200**					
U					100*1=**100**	30		2
			100*1=**100**	30				
V			200*1=**200**					2
	200*1=**200**							
W			200*1=**200**					2
	200*1=**200**							
X			200*1=**200**					1
		200*1=**200**						
Y			100*2=**200**	30*2=**60**				2
	100*2=**200**	30*2=**60**						
Z			100*3=**300**	30*3=**90**				2
	100*3=**300**	30*3=**90**						

Problem 14.9

The demand for subassembly S is 90 units in week 7. Each unit of S requires 1 unit of T and 1 unit of U. Each unit of T requires 2 units of V, 2 units of W, and 2 units of X. Finally, each unit of U requires 1 unit of Y and 3 units of Z. One firm manufactures all items. It takes 2 weeks to make S, 1 week to make T, 2 weeks to make U, 2 weeks to make V, 3 weeks to make W, 1 week to make X, 2 weeks to make Y, and 1 week to make Z.

Click the icon to view the product structure and the time-phased product structure.

Click the icon to view the on-hand inventory.

Suppose that in addition to 90 units of S, there is also a demand for 20 units of U, which is a component of S. The 20 units of U are needed for maintenance purposes. These units are needed in week 6. Modify the net material requirements plan to reflect this change.

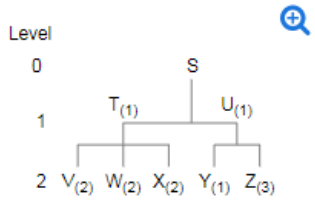
Construct a new net material requirements plan *(enter your responses as whole numbers)*.

Item		Week							Lead Time (weeks)
		1	2	3	4	5	6	7	
S	Gross req							90	
	On hand							20	
	Net req							70	2
	Order receipt							70	
	Order release					70			
T	Gross req					70			
	On hand					20			
	Net req					50			1
	Order receipt					50			
	Order release				50				

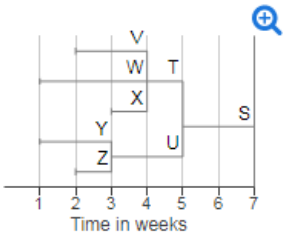
U	Gross req					70	20		
	On hand					30	0		
	Net req					40	20		2
	Order receipt					40	20		
	Order release			40	20				
V	Gross req				100				
	On hand				30				
	Net req				70				2
	Order receipt				70				
	Order release		70						
W	Gross req				100				
	On hand				30				
	Net req				70				3
	Order receipt				70				
	Order release	70							

X	Gross req				100				
	On hand				30				
	Net req				70				1
	Order receipt				70				
	Order release			70					
Y	Gross req			40	20				
	On hand			40	0				
	Net req			0	20				2
	Order receipt			0	20				
	Order release	0	20						
Z	Gross req			120	60				
	On hand			120	0				
	Net req			0	60				1
	Order receipt			0	60				
	Order release		0	60					

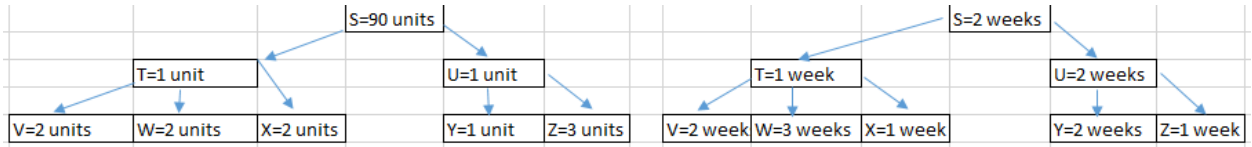
The product structure.



The time-phased product structure.



Item	On-Hand Inventory	Item	On-Hand Inventory
S	20	**W**	30
T	20	**X**	30
U	30	**Y**	40
V	30	**Z**	120



Item		1	2	3	4	5	6	7	Lead time (weeks)
S	Gross req							90	
	on hand							20	
	net req							70	2
	order recipt							70	
	order release					70			
T	Gross req					70			
	on hand					20			
	net req					50			1
	order recipt					50			
	order release				50				
U	Gross req					70	1*20=**20**		
	on hand					30	**0**		
	net req					70-30=**40**	1*20=**20**		2
	order recipt					70-30=**40**	1*20=**20**		
	order release			70-30=**40**	1*20=**20**				
V	Gross req				100				
	on hand				30				
	net req				70				2
	order recipt				70				
	order release			70					
W	Gross req				100				
	on hand				30				
	net req				70				3
	order recipt				70				
	order release			70					
X	Gross req				100				
	on hand				30				
	net req				70				1
	order recipt				70				
	order release			70					
Y	Gross req			**1*40=40**	**1*20=20**				
	on hand			**1*40=40**	**0**				2
	net req			**0**	**1*20=20**				
	order recipt			**0**	**1*20=20**				
	order release	**0**	**1*20=20**						
Z	Gross req			**3*40=120**	**2*20=60**				
	on hand			**3*40=120**	**0**				
	net req			**0**	**2*20=60**				1
	order recipt			**0**	**2*20=60**				
	order release		**0**	**2*20=60**					