

TF and MC part – Circle the answer.

1) Which of the following is NOT one of the four main types of inventory?

- A) raw material inventory
- B) work-in-process inventory
- C) maintenance/repair/operating supply inventory
- D) safety stock inventory
- E) finished-goods inventory

2) In ABC analysis, "A" items are the most tightly controlled.

- TRUE
- FALSE

3) Which category of inventory holding costs has a much higher percentage than average for rapid-change industries such as PCs and cell phones?

- A) housing costs
- B) material handling costs
- C) labor cost
- D) investment costs
- E) pilferage, scrap, and obsolescence

4) At the economic order quantity, holding costs are equal to product costs.

- TRUE
- FALSE

5) In the production order quantity model, inventory does not arrive in a single moment but flows in at a steady rate, resulting in a larger production/order quantity than in an otherwise identical EOQ problem.

- TRUE
- FALSE

6) Which of the following is NOT an assumption of the economic order quantity model shown below?

$$Q^* = \sqrt{\frac{2DS}{H}}$$

- A) Demand is known, constant, and independent.
- B) Lead time is known and consistent.
- C) Quantity discounts are not possible.
- D) Production and use can occur simultaneously.
- E) The only variable costs are setup cost and holding (or carrying) cost.

7) In the basic EOQ model, if the cost of placing an order doubles, and all other values remain constant, the EOQ will:

- A) increase by about 41%.
- B) increase by 100%.
- C) increase by 200%.
- D) increase, but more data is needed to say by how much.
- E) either increase or decrease.

8) When quantity discounts are allowed, the cost-minimizing order quantity:

- A) is always an EOQ quantity.
- B) minimizes the sum of holding and ordering costs.
- C) minimizes the unit purchase price.
- D) may be a quantity below that at which one qualifies for that price.
- E) minimizes the sum of holding, ordering, and product costs.

9) Service level is the complement of the probability of a stockout.

- TRUE
- FALSE

10) The purpose of safety stock is to:

- A) replace failed units with good ones.
- B) eliminate the possibility of a stockout.
- C) eliminate the likelihood of a stockout due to erroneous inventory tally.
- D) control the likelihood of a stockout due to variable demand and/or lead time.
- E) protect the firm from a sudden decrease in demand.

11) If daily demand is constant at 10 units per day, and lead time averages 12 days with a standard deviation of 3 days, 95 percent service requires how much safety stock?

- A) 28 units
- B) 30 units
- C) 49 units
- D) 59 units
- E) 114 units

12) Which of the following items is mostly likely managed using a single-period order model?

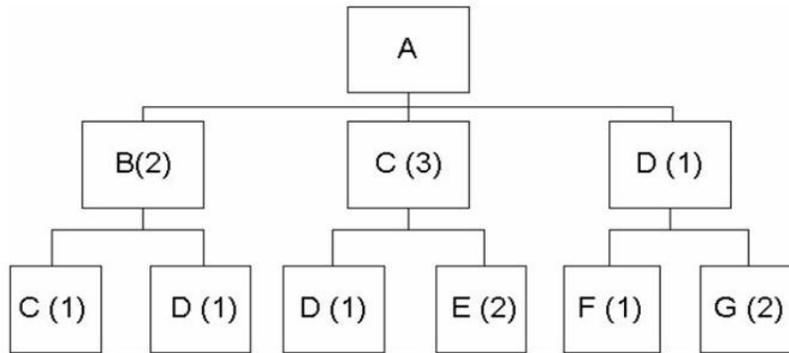
- A) Christmas trees
- B) canned food at the grocery store
- C) automobiles at a dealership
- D) metal for a manufacturing process
- E) gas sold to a gas station

13) The quantity required of a dependent demand item is computed from the demand for the final products in which the item is used.

- TRUE
- FALSE

- 14) "Phantom bills" are bills of material for subassemblies that do not exist in reality.
- TRUE
 - FALSE
- 15) The time-phased product structure, unlike the bill of material, adds the concept of lead times.
- TRUE
 - FALSE
- 16) By convention, the top level in a product structure is designated level 1.
- TRUE
 - FALSE
- 17) The minimum record accuracy required for successful MRP is approximately which of the following?
- A) lower than 90%
 - B) 90%
 - C) 95%
 - D) 97%
 - E) 99%
- 18) It is week 1 and there are currently 20 As in stock. We need 300 As at the start of week 5. If there are scheduled receipts planned for week 3 and week 4 of 120 As each and A has a lead time of 1 week, when and how large of an order should be placed to meet the requirement of 300 As?
- A) Week 1, 300 As
 - B) Week 1, 40 As
 - C) Week 5, 40 As
 - D) Week 4, 40 As
 - E) Week 4, 300 As
- 19) Which of the following is NOT a key benefit of MRP?
- A) increased quality
 - B) better response to customer orders
 - C) faster response to market changes
 - D) improved utilization of facilities and labor
 - E) reduced inventory levels

20) Consider the following product structure.



If the demand for product A is 50 units, how many units of component E will be needed?

- A) 4
- B) 100
- C) 200
- D) 250
- E) 300

21) In MRP, the number of units projected to be available at the beginning or end of each time period refers to:

- A) net requirements.
- B) scheduled receipts.
- C) planned order releases.
- D) projected on hand.
- E) the amount necessary to cover a shortage.

22) The lot-for-lot lot-sizing technique is particularly appropriate when demand is not very smooth and set up cost is small compared to holding cost.

- TRUE
- FALSE

23) Which lot-sizing technique orders the quantity needed during a predetermined time between orders?

- A) economic order quantity
- B) periodic order quantity
- C) lot-for-lot
- D) time fencing
- E) part-period balancing

CH12- Economic Production Quantity

1) CSUSM Manufacturing Company, in San Marcos, California, makes flashing lights for toys. The company operates its production facility 250 days per year. It has orders for about 15,000 flashing lights per year and has the capability of producing 120 per day. Setting up the light production costs \$100. The cost of each light is \$1. The holding cost is \$0.10 per light per year.

- a) What is the optimal size of the production run?
- b) What is the average holding cost per year?
- c) What is the average setup cost per year?
- d) What is the total cost per year, including the cost of the lights?

CH12- Quantity Discount Model

2) CSUSM Construction Company needs about 1000 tons of steel every month. The company estimates the holding cost to be 0.1% of the purchase price, and estimates order costs to be \$100 per order. The cost schedules of two local suppliers are as follows:

Escondido Supplier		Vista Supplier	
<i>Quantity</i>	<i>Price/ton</i>	<i>Quantity</i>	<i>Price/ton</i>
1-1000	169.5	1-1500	169.0
1001-3000	167.5	1501-4500	167.0
3000+	165.0	4500+	164.5

- a) What is the economic order quantity for each supplier?
- b) What quantity should be ordered, and which supplier should be used?
- c) What is the total cost for the most economic order size?

CH12- ROP & SS – Random Demand

3) SoMa Lyndon chairs are delivered to CSUSM chain of retail stores twice a year. The reorder point, without safety stock, is 200 chairs. Carrying cost is \$30 per unit per year, and the cost of a stockout is \$70 per chair per year. Given the following demand probabilities during the lead time, how much safety stock should be carried?

Demand During Lead Time	Probability
0	0.2
100	0.2
200	0.2
300	0.2
400	0.2

CH12- ROP & SS – Random Demand

4) A gourmet coffee shop in downtown San Francisco is open 200 days a year and sells an average of 75 pounds of Kona coffee beans a day. (Demand can be assumed to be distributed normally, with a standard deviation of 15 pounds per day.) After ordering (fixed cost = \$16 per order), beans are always shipped from Hawaii within exactly 4 days. Per-pound annual holding costs for the beans are \$3.

- a) What is the economic order quantity (EOQ) for Kona coffee beans?
- b) What are the total annual holding costs of stock for Kona coffee beans?
- c) What are the total annual ordering costs for Kona coffee beans?
- d) Assume that management has specified that no more than a 1% risk during stockout is acceptable. What should the reorder point (ROP) be?
- e) What is the safety stock needed to attain a 1% risk of stockout during lead time?
- f) What is the annual holding cost of maintaining the level of safety stock needed to support a 1% risk?
- g) If management specified that a 2% risk of stockout during lead time would be acceptable, would the safety stock holding costs decrease or increase?

CH14- Product Structure and Net Requirement Plan

6) Electro Fans has just received an order for one thousand 20-inch fans due week 7. Each fan consists of a housing assembly, two grills, a fan assembly, and an electrical unit. The housing assembly consists of a frame, two supports, and a handle. The fan assembly consists of a hub and five blades. The electrical unit consists of a motor, a switch, and a knob. The following table gives lead times, on-hand inventory, and scheduled receipts. Construct a product structure. Construct a time-phased product structure. Prepare a net material requirements plan .

Component	Lead Time	On-Hand Inventory	Lot Size* [assuming lot-for-lot]	Scheduled Receipt
20" Fan	1	100	-	
Housing	1	100	-	
Frame	2	-	-	
Supports (2)	1	50	100	
Handle	1	400	500	
Grills (2)	2	200	500	
Fan Assembly	3	150	-	
Hub	1	-	-	
Blades (5)	2	-	100	
Electrical Unit	1	-	-	
Motor	1	-	-	
Switch	1	20	12	
Knob	1	-	25	200 knobs in week 2

CH14- Lot Sizing

7) Jim Ashley, production planner for CSUSM Labs, in San Marcos, has the master production plan shown below:

Period (weeks)	1	2	3	4	5	6	7	8	9	10
Gross requirements	5	15	40		35		60		15	40

Inventory on hand at the beginning of week 1 = 10; Lead time = 1 period; setup costs = \$200; holding cost = \$10 per week; stockout cost = \$10 per week. Develop an ordering plan and costs for Jim, using these techniques: Lot-for-lot & EOQ (fill out the tables below). Which plan has the lowest cost?

LOT-for-LOT

Period (weeks)	1	2	3	4	5	6	7	8	9	10
Gross requirements	5	15	40		35		60		15	40
On hand Inventory (end of period)										
Net requirements										
Planned Order Receipt										
Planned Order Release										

EOQ

Period (weeks)	1	2	3	4	5	6	7	8	9	10
Gross requirements	5	15	40		35		60		15	40
On hand Inventory (end of period)										
Net requirements										
Planned Order Receipt										
Planned Order Release										