

BE/OM201
Solution of Take home quiz#1: Inventory Management
25 March 2020, 04:30-06:00 pm.

Student name: Student ID:

Instructions:

1. Specify your name and student ID above.
 2. It is an open book quiz and all calculating devices are permitted.
 3. Type or write your answer in the space under each question.
 4. Answer all of **THREE** questions on this quiz.
 5. Before submission, convert your answer sheet file to become PDF or JPEG and attach the file with your email being sent to OM201BE@gmail.com by 06:00 pm of Wednesday of 25 March 2020.
 6. Late submission will be not graded.
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Item 1. Perform an ABC analysis on the following set of products. Show your calculation in detail.
Which product items shall be categorized as A, B or C?

Item	Annual Demand (units)	Unit Cost (\$ per unit)
A211	1200	\$9
B390	100	\$90
C003	4500	\$6
D100	400	\$150
E707	35	\$2000
F660	250	\$120
G473	1000	\$90
H921	100	\$75

Answer: The table below details the contribution of each of the eight products. Item G473 is clearly an A item, and items B390 and H921 are all C items. Other classifications are somewhat subjective, but one choice is to label E707 and D100 as A items, and F660, C003, and A211 as B items.

Item	Annual Demand (units)	Unit Cost (\$ per unit)	Volume (\$)	Cumulative volume (\$)	Cumulative percent	Categories
G473	1000	\$90	\$90,000	\$90,000	29.6%	A
E707	35	\$2,000	\$70,000	\$160,000	52.6%	A
D100	400	\$150	\$60,000	\$220,000	72.3%	A
F660	250	\$120	\$30,000	\$250,000	82.2%	B
C003	4500	\$6	\$27,000	\$277,000	91.0%	B
A211	1200	\$9	\$10,800	\$287,800	94.6%	B
B390	100	\$90	\$9,000	\$296,800	97.5%	C
H921	100	\$75	\$7,500	\$304,300	100.0%	C
			\$304,300			

Item 2. What are the assumptions of the EOQ model?

Answer:

- (1) Demand for an item is known, reasonably constant, and independent of decisions for other items.
- (2) Lead time — that is, the time between placement and receipt of the order — is known and consistent.
- (3) Receipt of inventory is instantaneous and complete.
- (4) Quantity discounts are not possible.
- (5) The only variable costs are the cost of setting up or placing an order and the cost of holding or storing inventory over time.
- (6) Stockouts (shortages) can be completely avoided if orders are placed at the right time.

Item 3. A firm that makes electronic circuits has been ordering a certain raw material 250 ounces at a time. The firm estimates that carrying cost is $I = 30\%$ per year, and that ordering cost is about \$20 per order. The current price of the ingredient is \$200 per ounce. The assumptions of the basic EOQ model are thought to apply. For what annual demand is their action optimal? (ounces per year)

Answer: This problem reverses the unknown of a standard EOQ problem.

$$250 = \sqrt{\frac{2 \times D \times 20}{.3 \times 200}}; \text{ solving for } D \text{ results in } D = \frac{250^2 \times .3 \times 200}{2 \times 20} = 93,750 \text{ ounces per year.}$$