

Purchasing & Materials Management Exam III - Inventory Irritation II

Please complete the following exam. Read all instructions carefully and answer each question asked. Calculations are important but so are explanations and dialogue.

1. You are required to turn in this exam by the due date. Late papers will be appropriately downgraded.
2. Your work should consist of:
 - a. A cover sheet with your name and the date.
 - b. A **1-PAGE** Executive Summary of your work including explanations, calculations, diagrams, etc. Please feel free to include as much detail as you think necessary but remember you have limited space.
 - c. Executive summaries are expected to be typewritten (i.e., MS-Word, WordPerfect). However, calculations can be handwritten. Clarity and neatness are expected.
 - d. Please refer to the **website for further information regarding writing executive summaries**. You may use any font and spacing that is reasonable. i.e., 0.25-inch margins and font size 10 are at the low end of reasonable. Use **HEADERS** to break up your executive summary (e.g., INTRODUCTION, CONCLUSION, ETC.). Please spell-check your document. Remember you are presenting this to your boss.
 - e. Please attach all calculations, spreadsheets, diagrams, graphs, etc., to the back of the executive summary and label the section Appendix A. If you are running short on space in your executive summary, you may reference pages in the Appendix. (This may come in handy for certain diagrams, graphs, etc.)
3. You will be graded on both your calculations and your presentation. Calculations will be weighted approximately 75% and presentation (i.e., the executive summary) will be weighted 25%. Just a reminder, if I can't read it or find it, I can't grade it.

A typical exam will have the following parts, no more: Cover page, Exec. Summary, Appendix Cover Page, and Appendices

NOTE: I WANT ONLY 1 (ONE) EXECUTIVE SUMMARY THAT INCLUDES ALL EXAM PROBLEMS. DO NOT CREATE MORE THAN 1 (ONE) EXECUTIVE SUMMARY!! PLEASE EMAIL ME IF THIS IS NOT CLEAR.

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The ABC's of Inventory Management

John Quinonez had a preliminary solution to the inventory situation for his growing office supply business called "Office Warehouse." He had done a small study on some products but needed to complete a more comprehensive analysis soon. As before, he did not always have the cheapest prices, but he grew his business on having virtually anything any office might need and would guarantee delivery to any business within 50 miles. Needless to say, the delivery costs for John were high, but there was little he could do about that since that aspect was a significant competitive advantage for him.

Cost Cornucopia

Again what was bothering John was the increasing cost of inventory. He felt he had to keep plenty of inventory on hand to maintain his competitive advantage, but the inventory was costing him a large amount of money. First, some of the inventory was subject to spoilage or obsolescence. The fact that he had to scrap some items or keep some items around too long still bothered him greatly.

Inventory Inaccuracy

The point-of-sale computer terminals John used for cash registers," inventory still had to be constantly checked. As was stated earlier, mislabeling, accidentally placing material in the wrong location, and some inevitable shoplifting all took an agonizing toll on the inventory accuracy. In the past, some of his employees suggested he could help the situation by handling some inventory differently from others, but since they could not give him specifics as to how to do this, he continued to treat all inventory the same.

Ruth's Revelation

Ruth had told John that he should consider using ABC inventory principles together with more effective safety stock principles to reduce his cost while still maintaining his reputation for customer service and delivery. Ruth's initial analysis looked very promising so John had given her the go ahead to study the rest of the inventory.

Quantitative Quandary

Ruth had the "green light" to change the entire system and take the entire inventory and show him quantitatively how it might save money and still fulfill their business focus on availability. Table 1 summarizes the inventory data she developed. Help Ruth complete an ABC inventory analysis on the parts in Table 1.

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Table 1 – Inventory

Part Number	Average Weekly Sales	Item Value in Dollars	Part Number	Average Weekly Sales	Item Value in Dollars
A127	15	\$12.00	C664	21	\$16.78
A144	124	\$1.50	C791	101	\$9.54
A247	330	\$0.24	C973	216	\$11.03
B188	91	\$3.76	D291	13	\$87.90
B381	35	\$5.22	D452	88	\$117.23
B475	8	\$61.00	D523	31	\$0.17
B613	107	\$73.08	D747	12	\$23.44
B875	3	\$164.55	D990	125	\$53.87
B923	56	\$31.90	E111	65	\$78.21
C142	241	\$14.88	E326	4	\$258.70
C185	93	\$6.53	E456	85	\$46.66
C216	72	\$18.24	E567	24	\$25.40
C301	554	\$0.33	E569	52	\$48.20
C566	145	\$2.44	E678	41	\$1.34
C602	178	\$5.43	E991	36	\$12.55
A128	11	\$22.00	C665	91	\$11.78
A145	121	\$12.50	C792	31	\$19.54
A248	339	\$1.24	C974	26	\$1.03
B189	81	\$6.76	D292	33	\$7.90
B382	23	\$2.22	D453	38	\$17.23
B476	81	\$69.00	D524	81	\$1.17
B614	101	\$7.08	D748	72	\$2.44
B876	31	\$24.55	D991	35	\$33.87
B924	5	\$41.90	E112	61	\$28.21
C143	2421	\$24.88	E327	41	\$218.70
C186	91	\$61.53	E457	55	\$4.66
C217	7	\$11.24	E568	71	\$2.40
C302	54	\$11.33	E570	42	\$4.20
C567	15	\$21.44	E679	21	\$11.34
C603	78	\$51.43	E992	46	\$19.55
A129	151	\$14.00	C666	51	\$1.78
A146	12	\$14.50	C793	11	\$12.54
A249	30	\$22.24	C975	26	\$19.03
B190	9	\$13.76	D293	23	\$8.90
B383	351	\$57.22	D454	81	\$217.23
B477	81	\$67.00	D525	39	\$23.17
B615	10	\$75.08	D749	112	\$32.44
B877	31	\$136.55	D992	15	\$5.87
B925	51	\$3.90	E113	35	\$77.21
C144	24	\$1.88	E328	4	\$211.70
C187	99	\$0.53	E458	45	\$1.66
C218	7	\$2.24	E572	21	\$3.40
C303	55	\$23.33	E571	222	\$67.20
C568	45	\$21.44	E680	201	\$19.34
C604	78	\$15.43	E993	176	\$23.55

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JIT Jambalaya

Ruth had also informed John that the method he had been using to order not only shopping bags but also a number of items from his suppliers was not very efficient. John usually put in a few (3) big orders per year with the different suppliers. However, this led to problems with storage and delivery. Although John dealt with the problems he was open to ideas on how to improve. John knew the following information on his carrying costs, setup costs, and demand for six items he was having trouble with:

Demand/Cost	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
Annual Demand per yr	72,780	20,000	100	1,000	144	2,501
Carrying Cost per item per yr	\$0.10	\$2.00	\$5.00	\$6.00	\$25.00	\$0.10
Setup Cost per order	\$100	\$100	\$5	\$5	\$5	\$64

Ruth suggested using a simple EOQ model to determine the number of times John should order and when to order them. The business was open 350 days of the year. Help Ruth develop an EOQ model for each item in the above table and explain the results to John: How much to order, how many times a year to order, cycle time between orders, and total cost of the EOQ model compared to the manner in which John ordered in the past.

Ruth's Superlative Setup Suggestion

Ruth was not quite finished yet with suggestions. She had been talking around to different companies that bought the same sort of items from the same place as they did. She knew that the set-up cost they paid per order was too high for most items. In fact, she had heard others had negotiated a better number. Ruth had an idea that they could get their suppliers to deliver smaller lots more often. John had told her it would be nice if they could just have enough items on hand for one day of business. That would free up even more retail space in the store. Ruth needed to do some math to find out how many of the six items they need each day (e.g., Annual Demand/350). What would Ruth have to negotiate the set-up costs of each item to be to have an EOQ number for one days inventory? What would be the total cost of this ordering policy for each item? Do all the daily EOQ #'s make sense?