

科目	生產管理	適用 系所	工業工程與系統管理學系 A 組	時間	100 分鐘
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※請務必在答案卷作答區內作答。

A. Matching (20%)

共 5 頁 第 1 頁

1. (10%)

1. Supplier relationship matrix	A. Inventory held in one warehouse to service large number of retailers
2. Order batching	B. Strategic partnering
3. Warehousing strategy	C. Links product and process design to customer requirements
4. Quality function deployment	D. Detract from productivity of the entire SCM
5. SCORE	E. Cause of bullwhip effect
6. Risk pooling	F. Inventory service level requires high level of safety stock
7. Cross-docking	G. Chrysler's certification program
8. Critical decision making area in SCM	H. Risk pooling and reducing inbound transportation cost
9. Direct shipment strategy	I. Shows how only a balance between commitment to low prices and commitment to the relationship can be effective
10. Bullwhip effect	J. Most sophisticated of the distribution strategy

2. (10%)

1. Product-oriented layouts	A. Specialized equipment
2. Quality function deployment	B. Custom manufacturing
3. Reengineering	C. Provides a mechanism to evaluate processes prior to implementation
4. Service blueprinting	D. Minimizing mistakes in production processes
5. Batch production	E. Resources grouped into product families
6. Process-oriented layouts	F. Starting from a clean slate
7. Poka-yoke	G. Incrementally improving processes
8. Business process analysis	H. House of quality
9. Repetitive production	I. High-volume manufacturing
10. Cellular layouts	J. Group of identical products or customers processed

B. Problems and Questions: (80%)

1. World-class manufacturers compete on the five dimensions: cost, quality, flexibility, dependability and time on global market. Discuss the importance and roles of the five dimensions, and explain how to develop competitive advantages from the five dimensions. (10%)
2. Given the following data, use Capacity Planning Overall Factors (CPOF) to calculate the capacity required by the proposed MPS: (10%)

Total processing Time per Unit

Product X – 10 minutes

Product Y – 20 minutes

Standard Allocation

Stamping	20%
Electrical	20%
Assembly	40%
Inspection	10%
Pack & ship	10%

Proposed MPS

Period					
Product	1	2	3	4	5
X	20	20	10	20	20
Y	20	30	20	30	10

Capacity Requirements

Period					
	1	2	3	4	5
Total					
Stamping					
Electrical					
Assembly					
Inspection					
Pack & ship					

3. You are given this net requirements schedule : (10%)

	Week							
	1	2	3	4	5	6	7	8
Net requirements(units)	500	500	1,000	3,000	1,500	2,500	2,000	1,000

If it costs \$6,000 to get the final assembly department ready to assemble batches of this product, it costs \$30 to carry one unit in inventory for a year, and 52 weeks per year are worked by the final assembly department, develop a schedule of completed production lots for the product and calculate the cost of your schedule by using these methods :

- Lot-for-lot (LFL).
- Economic order quantity (EOQ).
- Period order quantity (POQ) using the order period of 4.

You may disregard the effects of initial inventory and safety stock on your calculations.

4. By referring the following table:

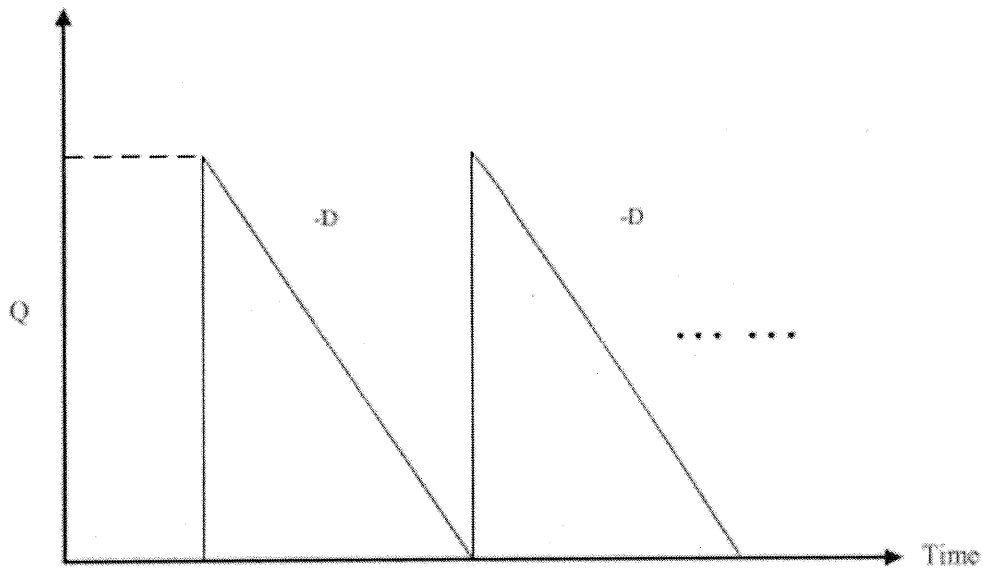
Period	D_t (demand)	$F_t(\alpha=0.3)$ (forecast)	$E_t=D_t - F_t$ (error)	$\alpha=0.3$ (MAD_t)	Tracking Signal TS_t
0				10	
1	120	100	20	[a]	1.5
2	140	106	34	19.3	[b]
3	160	[c]	[d]	[e]	[f]

(note: 1. Using smoothed mean absolute deviation in calculating Mad_t , 2. Show the way to find your solutions in detail, 3. Reason b. and c. with evidence)

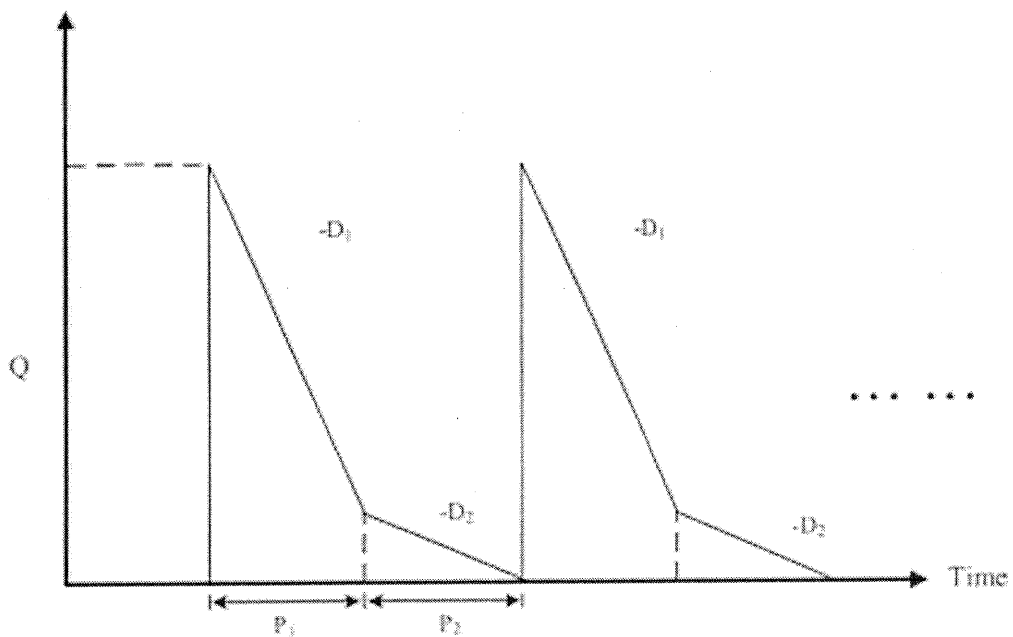
- Please recalculate the positions marked with [a], [b], [c], [d], [e], and [f]. (6%)
- Are there outliers detected in demand data at period 3? (5%)
- Shall we continue using present forecasting method after period 3 ? (5%)

5. Suppose D is the annual demand rate, S is the set up cost, C is unit cost, yearly i is carrying "interest rate". Q is lot size. The total cost per year, TC , is the sum of ordering cost per year and carrying cost per year. Please find the most economic order quantity Q^* for the following diagram. (You must find them with mathematical derivation)

a. (5%)



- b. D_1 and D_2 are annual demand rates for intervals 1 and 2 respectively. Assume the intervals P_1 and P_2 are equivalent. (15%)



6. A project network-along with activity times and costs is given in the following table.

Activity	Normal Time	Normal Cost	Crash Time	Crash Cost
1-2	3	\$40	1	\$80
1-3	2	\$50	1	\$120
1-4	6	\$100	4	\$140
2-4	4	\$80	2	\$130
3-4	3	\$60	1	\$140

- a. Calculate the normal completion time and normal total cost. (4%)
- b. To reduce the normal completion time by 3 days, please find the least-cost way, the associated total cost and completion time. (10%)