

**Q 8201**

M.E. DEGREE EXAMINATION, MAY/JUNE 2006.

Second Semester

Industrial Engineering

IE 1654 — SUPPLY CHAIN MANAGEMENT

(Regulation 2005)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the major objective of Supply Chain.
2. Draw the frame-work of supply chain decision making.
3. Name the different manufacturing strategy stages with reference to Global Manufacturing.
4. State the functional rule of various entities in a traditional supply chain.
5. Specify the factors which affect the optimum level of product availability.
6. When there will be distinction between product fill rate and order fill rate?
7. Specify some of the packages available for transportation planning and routing and scheduling.
8. What is meant by cross routing?
9. State the potential cost disadvantages of E-business.
10. State any two obstacles to coordination in the supply chains.

PART B — (5 × 16 = 80 marks)

11. Consider the supply chain for a domestic automobile
- (i) What are the components of the supply chain for the automobile? (4)
  - (ii) What are the different firms involved in the supply chain? (4)
  - (iii) What are the objectives of these firms? (4)
  - (iv) Provide examples of conflicting objectives in this supply chain. (4)
12. (a) (i) Compare and contrast descriptive models and normative models. (4)
- (ii) In what way do supply chain flows affect the success or failure of a firm like amazon.com? List two supply chain decisions that have a significant impact on supply chain profitability. (7)
  - (iii) Discuss the role of Information Technology in achieving strategic fit. (5)

Or

- (b) (i) Describe in detail the relationship between efficiency, responsiveness and demand uncertainty in a supply chain. (8)
  - (ii) Discuss in detail the key supply chain management issues. (8)
13. (a) (i) Identify and explain the managerial levers that reduce lot size and cycle inventory in a supply chain without increasing cost. (8)
- (ii) Daily demand for PC's at Dell is normally distributed with a mean of 2500 and a standard deviation of 500. A key component used in the PC assembly is the hard disk drive. The hard disk drive supplier takes an average of  $L = 7$  days to replenish inventory at Dell. Dell is targeting a cycle service level of 90 percent for its hard disk drive inventory. Evaluate the safety inventory of hard disk drive that dell must carry if the standard deviation of the lead time is 7 days. Dell is working with the supplier to reduce the standard deviation to zero. Evaluate the reduction in safety inventory that dell can expect as a result of this initiative. (8)

Or

- (b) (i) Write a short note on the importance of the level of product availability. (4)
- (ii) Assume that Dell is to manufacture 27 different PC's with three distinct components; processor, memory and hard drive. In the disaggregate option, Dell designs specific components for each PC,

resulting in  $3 \times 27 = 81$  distinct components. In the common component option, Dell Design's three distinct processors, three distinct memory units, and three distinct hard drives that can be combined to create 27 different PC's. Each component is thus used in nine different PC's. Monthly demand for each of 27 different PC's is independent and normally distributed with a mean of 5000 and a standard deviation of 3000. The replenishment lead time for each component is one month. Dell is targeting a cycle service level of 95 percent for component inventory. Evaluate the safety inventory requirements with and without the use of component commonality. Also evaluate the change in safety inventory requirements as the number of finish products of which a component is a part varies from one to nine. (12)

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- (a) (i) Evaluate in detail the strength and weakness of different modes of transportation. (8)  
(ii) Discuss in detail the trade-offs in transportation design. (8)

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- (b) (i) Specify the merits and demerits of using the saving matrix method and the generalised assignment method for routing and scheduling of vehicles. (8)  
(ii) Identify and explain the trade-offs that shippers need to consider when designing their transportation network. (8)
15. (a) (i) Discuss in detail about the managerial lever to achieve coordination in supply chain. (8)  
(ii) With an example discuss the value of E-Business in supply chain (for a Multinational Company). (8)

Or

- (b) What is the impact of web services technology in supply chain management? Specially how can a third party logistics provider use this technology to either improve services or provide new services? Explain with cases. (16)