

# School of Business

BBA  
ETE - Jun 2023

Time : 3 Hours

Marks : 100

## Sem IV - D1UA401T - Supply Chain Management

Your answer should be specific to the question asked

Draw neat labeled diagrams wherever necessary

1. Discuss the main challenges and key issues in supply chain management. Identify and explain the drivers that influence effective supply chain management. K2 CO2 (5)
2. Identify and discuss the drivers that influence transportation decisions in supply chain management. K2 CO1 (5)
3. Discuss the components of supply chain management, specifically sourcing, scheduling, and logistics. Explain the role of each component in ensuring an efficient and effective supply chain. K2 CO3 (5)
4. Examine the role of computer/IT in supply chain management. Discuss how digitalization has transformed supply chain operations and enabled the development of digital supply chain management. Explain the key technologies and tools used in digital supply chains. K2 CO4 (10)
5. Bell Computers purchases integrated chips at \$350 per chip. The holding cost is \$35 per unit per year, the ordering cost is \$120 per order, and sales are steady, at 400 per month. The company's supplier, Rich Blue Chip Manufacturing, Inc., decides to offer price concessions in order to attract larger orders. The price structure is shown below. K4 CO3 (10)

Rich Blue Chip's Price Structure

QUANTITY PURCHASED	PRICE/UNIT
1-99 units	\$350
100-199 units	\$325
200 or more units	\$300

- a) What is the optimal order quantity and the minimum annual cost for Bell Computers to order, purchase, and hold these integrated chips?
  - b) Bell Computers wishes to use a 10% holding cost rather than the fixed \$35 holding cost in 1. What is the optimal order quantity, and what is the optimal annual cost.
- 6) Thomas Kratzer is the purchasing manager for the headquarters of a large insurance company chain with a central inventory operation. Thomas's fastest-moving inventory item has a demand of 6,000 units per year. The cost of each unit is \$100, and the inventory carrying cost is \$10 per unit per year. The average ordering cost is \$30 per order. It takes about 5 days for an order to arrive, and the demand for 1 week is 120 units. (This is a corporate operation, and there are 250 working days per year.) K4 CO3 (10)
- a) What is the EOQ?
  - b) What is the average inventory if the EOQ is used?
  - c) What is the optimal number of orders per year?
  - d) What is the optimal number of days in between any two orders?
  - e) What is the total annual inventory cost, including the cost of the 6,000 units?

OR

K4 CO3 (10)

XYZ Corporation is a manufacturing company that produces a wide range of products. The company is facing challenges in managing its inventory effectively. To address this issue, they have decided to implement ABC analysis to classify their inventory items. They collect data on the annual demand and unit cost for each item.

Item A: Annual demand = 2,000 units, Unit cost = \$20  
Item B: Annual demand = 5,000 units, Unit cost = \$10  
Item C: Annual demand = 10,000 units, Unit cost = \$5  
Item D: Annual demand = 1,000 units, Unit cost = \$40  
Item E: Annual demand = 3,000 units, Unit cost = \$15

Question:

1. Apply ABC analysis to classify the inventory items based on the annual demand and unit cost provided. Calculate the total value and percentage contribution of each category (A, B, C).  
2. Discuss the implications of ABC analysis for inventory management. Based on your classification, explain how the different categories (A, B, C) should be managed differently in terms of inventory control, ordering policies, and stock management.
7. Explain the concept of the Law of Demand and its significance in pricing decisions. Discuss the factors that influence demand elasticity and how it affects pricing strategies. K3 CO5 (10)

PTO

- 8) The catering manager of La Vista Hotel, Lisa Ferguson, is disturbed by the amount of silverware she is losing every week. Last Friday night, when her crew tried to set up for a banquet for 500 people, they did not have enough knives. She decides she needs to order some more silverware, but wants to take advantage of any quantity discounts her vendor will offer. For a small order (2,000 or fewer pieces), her vendor quotes a price of \$1.80/piece. If she orders 2,001–5,000 pieces, the price drops to \$1.60/piece. 5,001–10,000 pieces brings the price to \$1.40/piece, and 10,001 and above reduces the price to \$1.25. Lisa's order costs are \$200 per order, her annual holding costs are 5%, and the annual demand is 45,000 pieces. For the best option:
- What is the optimal order quantity?
  - What is the annual holding cost?
  - What is the annual ordering (setup) cost?

### OR

Read the following case and answer the question at the end.

K5 CO3 (15)

Zhou Bicycle Company (ZBC), located in Seattle, is a wholesale distributor of bicycles and bicycle parts. Formed in 1981 by University of Washington Professor Yong-Pin Zhou, the firm's primary retail outlets are located within a 400-mile radius of the distribution center. These retail outlets receive the order from ZBC within 2 days after notifying the distribution center, provided that the stock is available. However, if an order is not fulfilled by the company, no backorder is placed; the retailers arrange to get their shipment from other distributors, and ZBC loses that amount of business.

The company distributes a wide variety of bicycles. The most popular model, and the major source of revenue to the company, is the AirWing. ZBC receives all the models from a single manufacturer in China, and shipment takes as long as 4 weeks from the time an order is placed. With the cost of communication, paperwork, and customs clearance included, ZBC estimates that each time an order is placed; it incurs a cost of \$65. The purchase price paid by ZBC, per bicycle, is roughly 60% of the suggested retail price for all the styles available, and the inventory carrying cost is 1% per month (12% per year) of the purchase price paid by ZBC. The retail price (paid by the customers) for the AirWing is \$170 per bicycle.

ZBC is interested in making an inventory plan for 2016. The firm operates for 250 days per year. The data collected for the past 2 years are summarized in the following table. A forecast for AirWing model sales in 2016 has been developed and will be used to make an inventory plan for ZBC.

Demands for Airwing Model

MONTH	2014	2015	2016
JAN	6	7	8
FEB	12	14	15
MAR	24	27	31
APR	46	53	59
MAY	75	86	97
JUN	47	54	60
JUL	30	34	39
AUG	18	21	24
SEP	13	15	16
OCT	12	13	15
NOV	22	25	28
DEC	38	42	47
<b>TOTAL</b>	<b>343</b>	<b>391</b>	<b>439</b>

Discussion Questions

- Develop an inventory plan to help ZBC.
- Discuss ROPs and total costs.

K5 CO4 (15)

9. A chain of home health care firms in Louisiana needs to locate a central office from which to conduct internal audits and other periodic reviews of its facilities. These facilities are scattered throughout the state, as detailed in the following table. Each site, except for Houma, will be visited three times each year by a team of workers, who will drive from the central office to the site. Houma will be visited five times a year. Which coordinates represent a good central location for this office? What other factors might influence the office location decision? Where would you place this office? Explain.
10. Todd's Direct, a major TV sales chain headquartered in New Orleans, is about to open its first outlet in Mobile, Alabama, and wants to select a site that will place the new outlet in the center of Mobile's population base. Todd examines the seven census tracts in Mobile, plots the coordinates of the center of each from a map, and looks up the population base in each to use as a weighting. The information gathered appears in the following table.

K4 CO3 (15)

CENSUS TRACT	POPULATION IN CENSUS TRACT	X, Y MAP COORDINATES
101	2,000	(25, 45)
102	5,000	(25, 25)
103	10,000	(55, 45)
104	7,000	(50, 20)
105	10,000	(80, 50)
106	20,000	(70, 20)
107	14,000	(90, 25)

- At what center-of-gravity coordinates should the new store be located?
- Census tracts 103 and 105 are each projected to grow by 20% in the next year. How will this influence the new store's coordinates?