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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2024

Department of Industrial Engineering

VII - Semester

IE5751 & SUPPLY CHAIN MANAGEMENT

(Regulation2019)

Time:3hrs Max.Marks: 100

CO1	Describe the role and drivers of and supply chain management in achieving competitiveness
CO2	Explain about Supply Chain Network Design
CO3	Illustrate about the issues related to Logistics in Supply Chain
CO4	Appraise about Sourcing and Coordination in Supply Chain
CO5	Application of Information Technology and Emerging Concepts in Supply Chain

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20Marks)

(Answer all Questions)

Q.No.	Questions	Marks	CO	BL
1	What is the role of logistics in supply chain management?	2	CO1	L1
2	What role does supply chain management play in achieving competitive advantage?	2	CO1	L1
3	What are the factors that influence distribution network design?	2	CO2	L2
4	A company is evaluating three potential warehouse locations with the following coordinates and expected demand: Warehouse 1 at (2, 3) with a demand of 50 units, Warehouse 2 at (8, 6) with a demand of 70 units, and Warehouse 3 at (4, 9) with a demand of 60 units. Using the center of gravity method, determine the optimal location (x, y coordinates) for a new warehouse to minimize transportation costs, assuming that transportation cost is directly proportional to the distance from the warehouse.	2	CO2	L2
5	Differentiate between 3PL and 4PL in logistics.	2	CO3	L1
6	Define routing and scheduling in transportation?	2	CO3	L1
7	What is the purpose of contracts in supply chain management?	2	CO4	L2
8	What is the impact of the bullwhip effect on inventory?	2	CO4	L1
9	What is the role of IT in supply chain management?	2	CO5	L1
10	What is E-Business in supply chain management, and how does it improve overall supply chain operations?	2	CO5	L2

PART- B (5x 13=65Marks)

Q.No.	Questions	Marks	CO	BL
11 (a)	How does Toyota align its supply chain strategy with its planning and operational processes to maintain efficiency and meet customer expectations across its global marketplace?	13	CO1	L3
	OR			
11 (b)	How does Walmart utilize key supply chain drivers such as technology integration, supplier relationships, and inventory management to enhance its operational efficiency and maintain its competitive advantage in the retail sector?	13	CO1	L3
12 (a)	Discuss the interrelation between the role of distribution, factors influencing distribution network design, and practical implementation of distribution networks in supply chain management?	13	CO2	L3
	OR			
12 (b)	A global electronics manufacturer is planning to expand its supply chain operations to a new region. The company needs to design an efficient supply chain network to optimize costs and improve service levels. The key decisions involve selecting the location and number of distribution centers, determining transportation modes, and evaluating inventory management strategies. Using this scenario as a basis, explain the framework for making network design decisions in a supply chain. Highlight the critical components involved and demonstrate how these components can be applied to the case of the electronics manufacturer.	13	CO2	L3
13 (a)	Explain the critical role of transportation in the supply chain. How does it influence cost, efficiency, and customer satisfaction?	13	CO3	L3
	OR			
13 (b)	Analyze Amazon's reverse logistics process, focusing on the reasons for high return rates, the key activities involved (such as inspection, refurbishment, and recycling), and the primary challenges faced (including cost, environmental impact, and regulatory compliance). How does Amazon balance customer satisfaction with operational and sustainability challenges in its reverse logistics strategy	13	CO3	L3
14 (a)	Analyze how the bullwhip effect impacted Procter & Gamble's Pampers supply chain, identifying the primary causes (such as order batching, reactive forecasting, lack of information sharing, and price promotions) and discussing the solutions implemented (including collaborative planning, demand data sharing, reduced promotions, and smaller, frequent shipments) to improve supply chain efficiency and reduce costs	13	CO4	L3
	OR			
14 (b)	Discuss the effects of a lack of coordination in the supply chain and explain how building strategic partnerships and trust can help	13	CO4	L3

	mitigate these issues and improve overall supply chain performance with case study?			
15 (a)	Discuss the future of IT in supply chains, particularly focusing on how E-Business strategies are transforming traditional supply chain operations. How can companies leverage E-Business to improve efficiency, reduce costs, and enhance customer satisfaction in their supply chain processes?	13	CO5	L3
	OR			
15 (b)	Toyota's lean supply chain management, centered around Just-in-Time (JIT) production, has been key to its efficiency and quality. As Toyota prepares to launch a new hybrid car model, the company faces challenges in optimizing its supply chain to meet demand without overstocking or causing delays. Analyze how Toyota's lean practices can be applied to this new model's production. Recommend strategies to enhance its supply chain performance while ensuring seamless production flow and minimizing waste.	13	CO5	L3

PART- C(1x 15=15Marks)

(Q.No.16 is compulsory)

Q.No.	Questions	Marks	CO	BL
16.	Develop a mathematical model for capacity allocation in a supply chain network with fixed costs, integrating the Analytic Hierarchy Process (AHP) for decision-making. Consider the following scenario: A company operates multiple distribution centers and suppliers in a supply chain network. The company needs to allocate production capacity at each distribution center while minimizing costs. The fixed costs for establishing a distribution center are given, and the variable cost depends on the production quantity at each center. The company must determine the optimal capacity allocation considering both costs and performance factors such as delivery time, quality, and customer demand. a) Formulate the mathematical model for this capacity allocation problem, including decision variables, objective function, and constraints. b) Integrate the AHP to prioritize and weight the factors influencing the decision (e.g., delivery time, quality, customer satisfaction, etc.).	15	CO2	L5