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**NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA**  
(An Autonomous Institute Affiliated to AKTU, Lucknow)

**MBA**

**SEM: III - THEORY EXAMINATION (2025 - 2026)**

**Subject: Supply Chain Management and Demand Forecasting**

**Time: 3 Hours**

**Max. Marks: 100**

**General Instructions:**

**IMP:** Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

**SECTION-A**

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1. Attempt all parts:-

- 1-a. In a supply chain strategy, which of the following scenarios best describes a "pull" system? (CO1, K2) 1
- (a) Products are manufactured based on sales forecasts
  - (b) Inventory is built up in anticipation of future demand
  - (c) Production begins only when a customer order is received
  - (d) Suppliers deliver materials on a fixed schedule
- 1-b. In an efficient supply chain, supplier selection is primarily focused on: (CO1, K2) 1
- (a) Flexibility and adaptability
  - (b) Minimizing costs
  - (c) Ensuring high quality
  - (d) Reducing lead times
- 1-c. Cyclical trends in time series data are characterized by: (CO2, K2) 1
- (a) Short-term fluctuations that last a few days
  - (b) Movements that recur over several years
  - (c) Changes that occur randomly with no pattern
  - (d) Seasonal changes within a single year
- 1-d. In a regression line equation  $y=bx+a$ , what does the y-intercept represent? (CO2, K3) 1
- (a) The value of y when  $x=0$
  - (b) The rate of change of y with respect to x
  - (c) The total change in y over the data set
  - (d) The maximum value of y in the data set

1-e.	Accurate Response (AR) focuses primarily on: (CO3, K3)	1
	(a) Speed and agility in responding to customer demands	
	(b) Delivering the right products in the right quantities at the right time	
	(c) Enhancing supplier reliability	
	(d) Optimizing manufacturing processes for flexibility	
1-f.	In supply network optimization, which of the following is a key decision in managing the flow of goods? (CO3, K3)	1
	(a) Determining the price of raw materials	
	(b) Deciding on sourcing strategies (e.g., single-source vs. multi-source)	
	(c) Selecting inventory storage systems	
	(d) Choosing transportation routes for inbound goods	
1-g.	The organizations can mitigate risks in capacity planning by (CO4, K3)	1
	(a) By reducing operational capacity	
	(b) By optimizing resource allocation	
	(c) By ignoring supply chain disruptions	
	(d) By increasing dependency on suppliers	
1-h.	The common challenge when dealing with bottlenecks is (CO4, K3)	1
	(a) High forecasting accuracy	
	(b) Overutilization of resources	
	(c) Identifying constraints in processes	
	(d) Increased production efficiency	
1-i.	The SCOR process that involves selecting and managing supplier relationships (CO5, K2)	1
	(a) Plan	
	(b) Make	
	(c) Source	
	(d) Return	
1-j.	Performance measures should ultimately: (CO5, K3)	1
	(a) Decrease customer focus	
	(b) Improve visibility and value delivery	
	(c) Complicate supply chain data	
	(d) Focus only on cost metrics	
2. Attempt all parts:-		
2.a.	Name the two cycles that involve the retailer in the supply chain process cycle. (CO1, K2)	2
2.b.	Enumerate components of demand management. (CO2, K3)	2
2.c.	Explain the impact of capacity constraints on supply chain decisions. (CO3, K3)	2
2.d.	Define capacity planning, and why is it important? (CO4, K2)	2
2.e.	Explain how does the SCOR model define the "Source" process (CO5, K3)	2
<b><u>SECTION-B</u></b>		<b>30</b>

3. Attempt all parts:-
- 3.a. Answer any one of the following:-
- 3.a.(i) Illustrate the various types of generic supply chains with relevant examples (CO1, K2) 6
- 3.a.(ii) Discuss the cycle view of a supply chain (CO1, K3) 6
- 3.b. Answer any one of the following:-
- 3.b.(i) Calculate Exponential Smoothing forecast for the 6<sup>th</sup> year with  $\alpha = 0.7$  6
- |       |    |    |    |    |    |
|-------|----|----|----|----|----|
| Year  | 1  | 2  | 3  | 4  | 5  |
| Sales | 30 | 25 | 35 | 25 | 20 |
- (CO2, K4)
- 3.b.(ii) Describe forecasting errors? Explain the terms Mean Absolute Error (MAE) and Mean Squared Error (MSE) with their formulas. (CO2, K3) 6
- 3.c. Answer any one of the following:-
- 3.c.(i) Analyze the objectives of Efficient Consumer Response (ECR) and explain how these objectives address inefficiencies in traditional supply chains. Support your answer with examples. (CO3, K4) 6
- 3.c.(ii) Describe CPFR process and explain how it helps improve supply chain efficiency. (CO3, K3) 6
- 3.d. Answer any one of the following:-
- 3.d.(i) Define capacity planning and explain its importance in supply chain management. (CO4, K3) 6
- 3.d.(ii) Outline the steps involved in the process of capacity planning. (CO4, K2) 6
- 3.e. Answer any one of the following:-
- 3.e.(i) Discuss how do supply chain performance measures help align operations with strategic goals? (CO5, K3) 6
- 3.e.(ii) Compare push and pull strategies in supply chain management, focusing on demand management, inventory levels, flexibility, and response to demand. Provide examples to support your answer. (CO5, K4) 6

**SECTION-C** 50

4. Answer any one of the following:-
- 4-a. Compare and contrast the manufacturing strategy, inventory strategy, and transportation strategy for efficient and responsive supply chains (CO1, K5) 10
- 4-b. Evaluate the role of the Toyota Production System (TPS) and Just-in-Time (JIT) in creating an efficient and lean supply chain. Explain the benefits and challenges of this approach? (CO1, K5) 10
5. Answer any one of the following:-
- 5-a. Fit a trend line to the following data by the least square method 10
- |                  |      |      |      |      |      |
|------------------|------|------|------|------|------|
| Year             | 2003 | 2005 | 2007 | 2009 | 2011 |
| Production('000) | 21   | 24   | 26   | 30   | 19   |
- (CO2, K4)
- 5-b. Analyse quantitative and qualitative techniques of forecasting (CO2, K4) 10
6. Answer any one of the following:-

- 6-a. Describe the CPFR process model and explain the significance of each phase (Planning, Forecasting, and Replenishment) in achieving seamless supply chain operations. (CO3, K3) 10
- 6-b. Explain the importance of facility location and capacity in supply network optimization. Discuss how centralized and decentralized facilities impact cost and responsiveness. (CO3, K3) 10
7. Answer any one of the following:-
- 7-a. Define sourcing decisions and discuss their significance in supply chain management. (CO4, K3) 10
- 7-b. Explain the key factors to consider during make or buy analysis? Provide detailed explanations. (CO4, K3) 10
8. Answer any one of the following:-
- 8-a. Analyse the five key areas of the SCOR model and their roles in supply chain management. (CO5, K4) 10
- 8-b. Compare and contrast the push and pull strategies in supply chain management across various factors like inventory levels, demand management, and lead times. (CO5, K5) 10

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