

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

**Course Code: IE306**

**Course Name: SUPPLY CHAIN AND LOGISTICS MANAGEMENT**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

Marks

- |   |    |  |     |
|---|----|--|-----|
| 1 | a) | Define Strategic fit.  | (2) |
|   | b) | Elaborate on drivers of supply chain performance.  | (6) |
|   | c) | Explain the importance of forecasting error estimates  | (7) |
| 2 | a) | List out the different forecasting methods   | (2) |
|   | b) | Prepare a case study on a supply chain of your choice  | (6) |
|   | c) | Explain the Winter's model of seasonal forecasting   | (7) |
| 3 | a) | What are the different flows of supply chain management?   | (2) |
|   | b) | Explain in detail the supply chain "planning decisions"  | (6) |
|   | c) | Using linear regression method forecast the demand for Dec 2019. Estimate the MAPE for the forecast model. | (7) |

Month	Demand	Month	Demand	Month	Demand
Jan-19	73	May-19	110	Sep-19	130
Feb-19	65	Jun-19	95	Oct-19	110
Mar-19	82	Jul-19	102	Nov-19	150
Apr-19	90	Aug-19	125		

**PART B**

*Answer any two full questions, each carries 15 marks.*

- |   |    |   |     |
|---|----|---|-----|
| 4 | a) | Highlight the economic justification for establishing a warehouse.  | (2) |
|   | b) | Explain any one quantitative model for location decision in supply chains.  | (6) |
|   | c) | ABC auto uses 5000 tyres per year. Each time an order for tyre is placed, an ordering cost of Rs 50 is incurred. Each tyre costs Rs 4000, and the holding cost is Rs 2/tyre/year. Assume that demand occurs at a constant rate and shortages are not allowed. What is the EOQ? How many orders will be placed each year? How much time will elapse between the placements of orders? Calculate annual holding cost, ordering cost and total cost. | (7) |

- 5 a) Present any two distribution network design models used in common supply chains. (2)
- b) Describe a strategic framework for facility location. List out some of the models for facility location and capacity location. (7)
- c) Detail the various information required in an aggregate plan. (6)
- 6 a) What is bullwhip effect? (2)
- b) Write a short note on Inventory Management Objectives and their effect on service level and ROI. (6)
- c) Determine optimal number of units to order. The yearly demand is 5,000 units, ordering cost is Rs 1000 per order and inventory holding cost is Rs 10 per unit per year. Calculate the setup cost, holding cost and total inventory cost. Number of working days in a year is 250 days. What is the ROP if the lead time for the order is 5 days? Due to change in suppliers the lead time has been revised to 3 days. What is the new ROP? (7)

### PART C

*Answer any two full questions, each carries 20 marks.*

- 7 a) What are the basic costs in transportation? (2)
- b) What are the different modes of transportation? Give their comparison (8)
- c) Solve the TSP problem with 4 trip stations from depot 'A' using nearest neighbourhood method and Clark-Wright algorithm. The distance matrix is provided in the matrix below. (10)

	A	B	C	D	E
A	-	5	7	7	10
B		-	2	3	3
C			-	5	10
D				-	4

- 8 a) List the factors affecting transportation decisions. (2)
- b) Explain the role and importance of International logistics and supply chain management in global economy. (8)
- c) Present the procedural steps of knapsack and bin packing problems with suitable examples. Highlight the differences between the two problems. (10)
- 9 a) What is green logistics? (2)
- b) Write down the importance of information technology in logistics industry. (8)
- c) Write a short note on vehicle routing problems, bin packing problems, fixed charge problems, and knapsack problems. (10)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Seventh semester B.Tech examinations (S), September 2020

**Course Code: IE306****Course Name: SUPPLY CHAIN AND LOGISTICS MANAGEMENT**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer any two full questions, each carries 15 marks.*

Marks

- 1 a) What is a supply chain? Explain with a neat sketch (3)  
 b) Explain the 'push/pull' view of a supply chain with neat sketch. (4)  
 c) Explain in brief the four types of forecasting methods. (8)
- 2 a) Explain supply chain 'strategic decisions'. (3)  
 b) What are the major drivers of supply chain performance? (5)  
 c) From the data given below, find out the following forecast error estimates: (7)  
 (1) Mean Forecast Error (2) Mean Absolute Deviation (3) Mean Square Error and (4) Mean Absolute Percentage Error.

T	Demand, D	Forecast, F
1	150	165
2	160	165
3	165	165
4	175	165
5	180	165

- 3 a) Describe the four cyclic processes viewable in the supply chain interfaces with a sketch. (4)  
 b) What do you mean by competitive strategy and supply chain strategy? (4)  
 c) Explain Holt's model of forecasting. (7)

**PART B***Answer any two full questions, each carries 15 marks.*

- 4 a) Explain the three aggregate planning strategies. (7)  
 b) The annual demand for an item is 3200 units. The unit cost is Rs.6.00 and the inventory carrying charges is 25% per annum. If the cost of one procurement is Rs.150.00, determine: (8)  
 1. Economic Order Quantity.  
 2. Number of orders per year.  
 3. Time between two consecutive orders.  
 4. Total optimal cost including purchase cost.

- 5 a) List out any four factors influencing network design decisions and briefly explain them. (8)
- b) Explain the P-system and Q-system of inventory management. (7)
- 6 a) Consider a single facility location problem in which a new plant will supply raw materials to five existing plants which have locations of (400, 200), (800, 500), (1100, 800), (200, 900) and (1300, 300). Assuming that the number of tons of materials transported per year from the new plant to the existing plants as 450, 1200, 300, 800 and 1500 respectively, determine the optimum location for the new plant such that the distance moved is minimized. (5)
- b) Explain bullwhip effect with sketch. (7)
- c) What is the information required by an aggregate planner? (3)

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) Explain in detail about 3PL and 4PL providers. (10)
- b) Explain closed loop supply chain. (10)
- 8 a) Explain direct shipping network and direct shipping with milk runs. (10)
- b) Write a note on knapsack problem. Give any two examples. (10)
- 9 a) Explain the following terms related to logistics management briefly: (10)  
(1) Logistics (2) Outsourcing (3) Cross docking (4) Transportation  
(5) Replenishment
- b) Explain the importance of reverse logistics in this current era of intense competition. (10)

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**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

Seventh Semester B.Tech Degree Examination (Regular and Supplementary), December 2020

**Course Code: IE306****Course Name: SUPPLY CHAIN AND LOGISTICS MANAGEMENT**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer any two full questions, each carries 15 marks.*

Marks

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|---|--|-----|
| 1 | a) What is meant by supply chain management?   | (3) |
|   | b) Explain the 'operation decisions' of supply chain?  | (5) |
|   | c) Explain the four components of 'time series analysis'   | (7) |
| 2 | a) What do you mean by supply chain surplus?   | (3) |
|   | b) List out any five inventory-related metrics of supply chain performance with a brief description. | (5) |
|   | c) Explain the various forecast errors.  | (7) |
| 3 | a) What do you mean by 'supply chain efficiency' and 'supply chain responsiveness'?                  | (3) |
|   | b) Explain the obstacles to achieving strategic fit.   | (4) |
|   | c) Differentiate moving average and exponential smoothing methods of forecasting.                    | (8) |

**PART B***Answer any two full questions, each carries 15 marks.*

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|---|--|-----|
| 4 | a) How is supply chain network design decisions classified?  | (3) |
|   | b) What are the main operational parameters which an aggregate planner has to identify?  | (5) |
|   | c) Explain the various costs involved in arriving at the total annual cost in inventory system.  | (7) |
| 5 | a) Describe the following basic types of layouts: (1) Product layout (2) Process layout (3) Fixed position layout  | (8) |
|   | b) A company buys 20,000 bottles per annum. The cost per bottle is Rs. 4 and the ordering cost is Rs. 100. The inventory carrying cost is estimated at 15% of unit value. Determine: | (7) |

1. The optimal quantity.
  2. Inventory cycle duration.
  3. Number of orders to be placed per year.
  4. Total annual inventory cost including purchase cost.
- 6 a) What is bullwhip effect in supply chain? (4)
- b) What are the factors determined through aggregate planning, based on the inputs to it? (3)
- c) Explain the terms: (1) EOQ (2) Cycle inventory (3) Echelon inventory (8)  
(4) Seasonal inventory

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) Explain the principle of 3PL highlighting the service category and the basic services provided. (10)
- b) Explain the concept of reverse logistics. (10)
- 8 a) Explain the transportation and inventory cost trade-offs when making transportation decisions. (10)
- b) Differentiate knapsack and bin packing problems. (10)
- 9 a) Explain the following modes transportation in supply chain management: (10)  
(1) Package carriers (2) Pipeline (3) Intermodal (4) Truck and (5) Rail
- b) Describe the importance of closed loop supply chain. (10)

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