

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 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) Give five examples of supply chain “metrics” used for performance measurement? (5)
  - b) Show with the help of a line diagram “conjoint structure” of supply chain management? (3)
  - c) Explain in detail the methods of managing “demand”? (7)
- 2
  - a) What are the different flows of supply chain management? (3)
  - b) Explain in detail the supply chain “planning decisions”? (5)
  - c) What is “mean absolute percentage error” (MAPE) of forecasting? What is the type of demand variation suitable for this type of error estimate? (7)
- 3
  - a) What is difference between push and pull view of supply chain? (3)
  - b) What is meant by implied demand uncertainty? Explain. (4)
  - c) The demand for a product “umbrella” shows seasonal demand. The demand analysed quarterly of an year. By the analysis of three years data, the following values are calculated. Level of demand  $L = 16700$  units, Trend  $T = 375$  units. The demand and seasonal factors for first four periods are given in the table. Find out the corrected level and trend for the period one to four, forecast for the period one to five and corrected seasonal factor for period five using Winter’s model of forecasting? Smoothing constant for level  $\alpha = 0.1$ , Smoothing constant for trend  $\beta = 0.2$ , Smoothing constant for seasonal factor  $\gamma = 0.1$ . (8)

Period	Demand	Level	Trend	Seasonal Factor	Forecast
t	D	L	T	S	F
		16700	375		
1	7550	?	?	0.45	?
2	12550	?	?	0.66	?
3	22050	?	?	1.19	?
4	32050	?	?	1.60	?
5				?	?

**PART B**

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

- 4
  - a) Discuss about the load matrix, distance matrix and relationship matrices used for layout problems. (7)
  - b) Assume that weekly demand for phones at XYZ company is normally distributed with a (8)

mean of 2500 and a standard deviation of 500. The manufacturer takes two weeks to fill an order placed by the company. The store manager currently orders 10000 phones when the inventory on hand drops to 7000. Evaluate the safety inventory and the average inventory carried by XYZ. Also evaluate the average time a phone spends at XYZ company.

- 5 a) Discuss about the information required and outputs determined in an aggregate plan. (8)
- b) Explain Bullwhip effect in supply chains with an example. (7)
- 6 a) Explain any two pure strategies for aggregate planning. (8)
- b) Derive an expression for optimum lot sizing (EOQ) in a single product ordering case without stock outs. (7)

### PART C

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

- 7 a) 'A shipper's goal is to minimize the total cost of fulfilling a customer order while achieving the responsiveness promised.' Discuss various costs involved in taking shippers transportation decisions. (10)
- b) What is reverse logistics and how it is different than forward logistics? (10)
- 8 a) Discuss the strength and weakness of different modes of transportation. (10)
- b) Explain knapsack problem. List three practical examples of knapsack problem. (10)
- 9 a) 'The trade-off between transportation and inventory costs is significant when designing a supply chain network'. Why? (5)
- b) Explain the principle of 4PL concept? (5)
- c) Why has the closed loop supply chain become such an important part of consumer electronics manufacturing? (10)

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