

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2019

Program Name: B-Tech ME (Core, Specialization)

Course Name: Supply Chain Management

Course Code: IPEG 423

Nos. of page(s): 3

Semester: V1

Time: 03 hrs

Max. Marks: 100

Instructions: If data is insufficient, make relevant assumptions and state the same.

SECTION A (Marks 30)

Sl. No.		Marks	CO
Q 1	a) What are the factors affecting the levels of safety inventory? b) How the optimum level of product availability is obtained in supply chain? c) What are the major network design decisions taken by the management in a supply chain? d) What are the three key supply chain decision phases? e) Identify the key obstacles faced by managers for coordination in supply chain. f) What is the difference between marginal quantity discounts and all quantity discounts?	6x1 =6	CO1
Q 2	a) Dell supply chain is more responsive than Ford supply chain. Do you agree with this statement? If you were tasked to design a supply chain for selling fashion apparels, which system will you use? Give reasons. b) A junior level manager in charge of maintaining operations in supermarket is faced with several challenges. In your opinion what are the key challenges faced by him in maintaining the supply chain?	4x2=8	CO3 CO2
Q3	What is the bullwhip effect, and how does it relate to lack of coordination in a supply chain?	8	CO3
Q4	Weekly demand for Jeans at Trends is normally distributed with a mean of 100 and standard deviation of 50. The supply plant takes 3 weeks to supply an order from Trends. The store manager monitors its inventory continuously and reorders jeans when the available inventory drops below 350. How much safety stock does the store carry? What CSL does the store achieve? If the store manager wants to target a CL of 95% how much safety stock should the store carry? What should be the ROP?	8	CO4
SECTION B (Marks 45)			
Q5	Consider BigBazar deciding on the size of its replenishment order from Hindustan Unilever. a) What costs should it take into account when making this decision? b) If the store manager wants to decrease the lot size without increasing the costs he	10+5	CO2

	incur, what actions shall he take?		
Q6	The manager at Sportmart, a sporting goods store has to decide on the number of skis to purchase for the winter season. Based on the past demand data and weather forecasts for the year, management has forecast demand to be normally distributed, with a mean of 450 and a standard deviation of 80. Each pair of skies costs Rs 6000 and retails for a price of Rs 16,000. Any unsold skis at the end of season are disposed of for Rs 5000. Assume that it costs Rs 300 to hold a pair of skis in inventory for the season. How many skis should manager order to maximize the expected profits?	15	CO4
Q7	Reliance digital has built a new warehouse as it has grown. How does this change affect various cost and response times in its supply chain?	15	CO3 CO4
	OR		
Q7	Samsung is planning to launch Galaxy S10 in April 2019 in India. Knowing that lot of competitor models are planned for launch later in the year company foresee high demand uncertainty. How can aggregate planning be used for production of Galaxy S10?	15	CO3 CO4
SECTION-C (Marks 25)			
Q 8	<p>Walmart being a consumer product super store has a large warehouse in the Chicago region and is deciding on the policy for the use full truck load (FTL) or less than full truckload (LTL) transportation for its inbound shipping. LTL costs \$1.5 per unit. FTL costs unit \$1000 per truck plus \$100 per pick up from 3 suppliers. A truck can carry up to 2500 units. Walmart incurs a fixed cost of \$100 for each order placed with a supplier. Each item/unit costs \$50 and the warehouse incurs a holding cost of 10%. Walmart estimates the products from each supplier has a monthly demand of 1500 units.</p> <p>a) What is the optimal ordering size and annual cost per product if LTL shipping is used? What is the time between orders?</p> <p>b) What is the optimal ordering size and annual cost per product if FTL shipping is used with a separate truck for each supplier? What is the time between orders?</p> <p>c) What is the optimal order size and annual cost per product if FTL shipping is used with two suppliers grouped together in a truck? What is the time between orders?</p> <p>d) What is the optimal order size and annual cost per product if FTL shipping is used with three suppliers grouped together in a truck? What is the time between orders?</p> <p>e) Which shipping policy will you recommend if each product has a monthly demand of 1500 units ?</p>	4*6+1=25	CO4
	OR		

Q8	<p>Harley purchases components from three suppliers. Components purchased from supplier A are priced at \$5 each and used at the rate of 20,000 units per month. Components purchased from supplier B are priced at \$4 each and are used at the rate of 2,500 units per month. Components purchased from supplier C are priced at \$5 each and used at the rate of 900 units per month. Currently Harley purchases a separate truck load from each supplier. As part of its JIT drive Harley has decided to aggregate purchases from the three suppliers. The trucking company charges a fixed cost of \$400 for the truck with an additional charge of \$100 for each pickup. Thus if Harley asks for a pickup from only one supplier the trucking company charges \$500; from two suppliers, it charges \$600; and from three suppliers it charges \$700. Suggest a replenishment strategy for Harley that minimizes annual cost. Assume a holding cost of 20% per year compare the cost of your strategy with Harley's current strategy of ordering separately from each supplier. What is the cycle inventory of each component at Harley?</p>	25	CO4
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SECTION A (Marks 30)

Sl. No.		Marks	CO
Q 1	a) What is the role of safety inventory in a supply chain? b) Identify the various flows occurring in a supply chain c) Dell supply chain is very responsive. Comment true/false and give one reason to support your view. d) Why do suppliers offer quantity discounts? e) In a super market dedicated to consumer goods, which replenishment policy will you suggest for ensuring product availability? Mention one reason to justify your answer. f) What are the various costs associated in maintaining inventory in a supply chain?	6x1 =6	CO1
Q 2	a) What is the difference between all quantity discount and marginal quantity discount? b) A junior level manager in charge of maintaining operations in supermarket is faced with several challenges. In your opinion what are the key challenges faced by him in maintaining the supply chain?	4x2=8	CO1 CO2
Q3	Demand for fasteners at Grainger is 20,000 boxes per month. The holding cost is 20% per year. Each order incurs a fixed cost of \$300. The supplier offers a marginal unit discount pricing scheme with a price of \$5 per box for the first 30,000 and a price of \$4.8 per box above 30,000 in an order. How many boxes of fasteners should Grainger order per replenishment?	8	CO4
Q4	What are the various levels of implied demand uncertainty in supply chain? Give examples and explain	8	CO2 CO3

SECTION B (Marks 45)

Q 5	a) What role does forecasting play in the supply chain of winter clothing manufacturer such as Oswal?	15	CO2 CO3
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	b) How do static and adaptive forecasting methods differ?		
Q6	The manager at Reliance digital, a consumer electronics store has to decide on the number of Air coolers to purchase for the summer season. Based on the past demand data and weather forecasts for the year, management has forecast demand to be normally distributed, with a mean of 300 and a standard deviation of 50. Each air cooler costs Rs. 3000 and retails for a price of Rs. 6,000. Any unsold air coolers at the end of season are disposed of for Rs. 2500. Assume that it costs Rs 200 to hold a pair of air coolers in inventory for the season. How many air coolers should manager order to maximize the expected profits?	15	C04
Q7	Samsung is planning to launch Galaxy S10 in April 2019 in India. Knowing that lot of competitor models are planned for launch later in the year company foresee high demand uncertainty. How can aggregate planning be used for production of Galaxy S10?	15	C02 C03
	OR		
Q7	Amazon sells equipment from five warehouses in United States. W.W Grainger sells products from 350 retail locations supported by several warehouses. In both cases customers place orders using the Internet or on the phone. Discuss the pros and cons of the two strategies.	15	C03 C04
SECTION-C (Marks 25)			
Q 8	Harley purchases components from three suppliers. Components purchased from supplier A are priced at \$5 each and used at the rate of 20,000 units per month. Components purchased from supplier B are priced at \$4 each and are used at the rate of 2,500 units per month. Components purchased from supplier C are priced at \$5 each and used at the rate of 900 units per month. Currently Harley purchases a separate truck load from each supplier. As part of its JIT drive Harley has decided to aggregate purchases from the three suppliers. The trucking company charges a fixed cost of \$400 for the truck with an additional charge of \$100 for each pickup. Thus if Harley asks for a pickup from only one supplier the trucking company charges \$500; from two suppliers, it charges \$600; and from three suppliers it charges \$700. Suggest a replenishment strategy for Harley that minimizes annual cost. Assume a holding cost of 20% per year compare the cost of your strategy with Harley's current strategy of ordering separately from each supplier. What is the cycle inventory of each component at Harley?	25	C04
	OR		
Q8	An electronics company has two contract manufacturers in Asia: Foxconn assembles its tablets and smartphones and Flextronics assembles its laptops. Monthly demand for tablets and smartphones is 10,000 units, whereas that of laptops is 4000. Tablets cost the company \$100, laptops costs \$400 and the company has a holding cost of 25%. Currently the company has to place separate orders with Foxconn and Flextronics and receives separate shipments. The fixed cost of each shipment is \$10,000. What is the optimal order size and order frequency with each of Foxconn and Flextronics The company is thinking of combining all assembly with the same contract manufacturer. This will allow for a single shipment of all products from Asia. If the	25	C04

	fixed cost of each shipment remains \$10,000 what is the optimal order frequency and order size from the combined orders? How much reduction in cycle inventory can the company expect as a result of combining orders and shipments?		
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