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MANIPAL INSTITUTE OF TECHNOLOGY
A Constituent Institute of Manipal University, Manipal

II SEMESTER M.TECH. (ENGINEERING MANAGEMENT)

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: SUPPLY CHAIN MANAGEMENT [HUM 5242]

(27/04/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** questions.
- Missing data may be suitable assumed.

1A. With the help of an example, briefly explain the concept of reverse supply chain management. **3 marks**

1B. With the help of neat diagrams, explain, with examples, the concepts of make to stock, make to order and configure to order. **4 marks**

1C. HP has outsourced its manufacturing activities to third party electronic manufacturing service (EMS) companies like Flextronics but has kept sourcing activities in-house. Firms like Flextronics argue that since they buy inputs for a large number of clients, they have better economies of scale compared to HP, and HP may be better off by outsourcing sourcing activities to EMS companies. Why do you think HP wants to keep its control on sourcing? **3 marks**

2A. A company is examining two alternative choices for moving goods from its plant in Thane to its depot in Chennai. It has been traditionally shipping goods in the FTL mode so as to save transportation costs. Its finance department has been complaining about high inventories at Chennai. A FTL results in a shipment size of 160 units, while LTL shipments allow the firm to get lots of 40 units each. The average demand at the Chennai depot is 80 units per month. The cost of the product is Rs.500 per unit and the firm works with an inventory carrying cost of 20 percent. Shipping through FTL mode results in a transport cost of Rs. 40 per unit, while the LTL mode shipment results in a transport cost of Rs 50 per unit. **6 marks**

a. Should the company shift to LTL shipments? Justify.
b. The firm realizes that LTL shipments result in damages of 1 percent of the goods shipped. How will this information affect the decision?
c. Currently, the firm is going through serious working capital problems and the finance department has informed marketing that inventory will be charged at an inventory carrying cost of carrying cost of 30 percent. How will this affect the transportation mode decision?

2B. Formulate a Linear Programming Problem for the network design problem (cost minimization). **4 marks**

3A. With a neat diagram, explain IT in Supply Chain Collaboration and Coordination. **3 marks**

3B. Briefly explain the concept of Bullwhip effect. Identify five prominent causes of the bullwhip effect. **4 marks**

3C. Explain the business blueprint phase of an ERP implementation. Why is Business Blueprinting considered as one of the critical phases of the implementation? **3 marks**

4A. What are some of the long term and short term forces that influence Green supply chain decisions? Explain briefly. **4 marks**

4B. **6 marks**

Zara manufacture approximately 50% of its products in its own network of 22 Spanish factories (18 of which are located in and around the La Coruña complex) but use subcontractors for all sewing operations. These factories generally work a single shift and are managed as independent profit centers. The other half of its products are procured from 400 outside suppliers, 70% of which are in Europe, and most of the rest in Asia.
Many of the European suppliers are based in Spain and Portugal, and Zara exploit this geographical proximity in order to ensure quick response to Zara orders – critical for fashion products. From Asia, Zara procure "basic" products and those for which the region has a clear cost or quality advantage. With its relatively large and stable base of orders, Zara is a preferred customer for almost all its suppliers. The make or buy decisions are usually made by the procurement and production planners. The key criteria for making this decision are required levels of speed and expertise, cost-effectiveness, and availability of sufficient capacity. If the buyers cannot obtain desired prices, delivery terms, and quality from Zara factories, they are free to look outside. For its in-house production, Zara obtain 40% of its fabric supply from another Inditex-owned subsidiary, Comditel (Zara account for almost 90% of their total sales). Over half of these fabrics are purchased undyed to allow faster response to mid-season color changes.

To facilitate quick changes in printing and dyeing, Zara also work closely with Fibracolor (a dyestuff producer part owned by Inditex - Zara purchase 20% of its output). The rest of the fabrics come from a range of 260 other suppliers, none account for more than 4% of Zara's total production in order to minimize any dependency on single suppliers and encourage maximum responsiveness from them. After in-house CAD controlled piece cutting, Zara use subcontractors for all sewing operations. The subcontractors themselves often collect the bagged cut pieces, together with the appropriate components (like buttons and zippers) in small trucks. There are some 500 sewing subcontractors in very close proximity to La Coruña (in the Galicia region) and most work exclusively for Zara. Zara closely monitor their operations to ensure quality, compliance with labor laws, and above all else adherence to the production schedule. Subcontractors then bring back the sewn items to the same factory, where each piece is

inspected during ironing (by machine and by hand). Finished products are then placed in plastic bags with proper labels and then sent to the distribution center. A system of aerial monorails connects ten of the factories in La Coruña to the distribution center. Completed products procured from outside suppliers are also sent directly to the distribution center.

Identify factors from the above case study to demonstrate Zara's commitment towards achieving an agile supply chain.

5A. The monthly forecast for a product and production days available are given in the table below: **5 marks**

Month	January	February	March	April
Aggregate Demand (Units)	1260	1430	1100	880
Production Days	21	22	20	22

The Management is considering hiring and laying off workers as needed to produce exact monthly requirements. Assume that there are 10 workers at the beginning of January. The workers are paid at the rate of Rs.72 per day for 8 hours of working. It requires 1.6 hours to produce one unit for a worker. The hiring cost is Rs.1000/worker and lay-off cost is Rs.1400/worker. Prepare the aggregate plan using the above strategy and determine the total cost of the plan?

5B. **5 marks**

Explain the following concepts

a) RFID in supply chain
b) Vendor managed Inventory

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