

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)

DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination

Course No. : BTM 4523

Course Title : Logistics and Supply Chain Management

Winter Semester, A. Y. 2022-2023

Time : 3 hours

Full Marks : 150

Answer all 6 (six) questions. All questions carry equal marks. Marks of each question and corresponding CO and PO are written in the right margin with brackets.

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|-------|--|----|----------------|
| 1. a) | Briefly explain the concepts of Six Sigma and Lean Six Sigma. How does lean six sigma enhance business excellence and sustainability? Give example. | 10 | (CO2)
(PO8) |
| b) | Identify the relationship with reasoning and graphical presentation. | 09 | (CO1)
(PO1) |
| | i. Inventory cost and number of facilities. | | |
| | ii. Transportation cost and number of facilities. | | |
| c) | What is economic manufacturing quantity model of production system? Illustrate with example. | 06 | (CO2)
(PO8) |
| 2. a) | "The six drivers of supply chain do not act independently but interact to determine the overall supply chain performance." Do you agree with this statement? Why or why not? | 08 | (CO1)
(PO1) |
| b) | Differentiate between the following concepts along with their implications: | 08 | (CO1)
(PO1) |
| | i. Centralized and decentralized purchasing. | | |
| | ii. Single sourcing and multiple sourcing. | | |
| c) | What is buffer stock? What are the impacts of desired product availability and uncertainty on safety inventory to ensure supply chain sustainability? Discuss. | 09 | (CO3)
(PO8) |
| 3. a) | What do you mean by zone of strategic fit? How zone of strategic fit can be achieved by integrating implied demand uncertainty and responsiveness to ensure society's benefit? Explain with example. | 09 | (CO2)
(PO8) |
| b) | What do you mean by capacity planning? Illustrate the types of capacity planning strategies. | 08 | (CO2)
(PO8) |
| c) | Define third party logistics in supply chain? What might be the challenges of using third party logistics for a company? Give example. | 08 | (CO1)
(PO1) |
| 4. a) | Explain the concept of total quality management. Why cause and effect diagram are being used as a quality measurement tool? Now, construct a cause-and-effect diagram for the following problem: A local fast-food shop in Mohammadpur was serving its customer for 2 years. Recently, the overall quality of the business is deteriorating and its customers are switching to its nearby competitors. | 13 | (CO2)
(PO8) |

- b) A firm should add facilities beyond the cost-minimizing point only if managers are confident that the increase in revenues because of better responsiveness is greater than the increase in costs due to additional facilities sustainable supply chain performance. Do you agree with this statement? Justify your opinion with example. 07 (CO3) (PO8)
- c) What are the sources of risk that affect global supply chain performance? 05 (CO3) (PO8)
5. a) Explain the concept of green supply chain and sustainable supply chain. How does green supply chain affect sustainability? Do you think that sustainable supply chain is important for ensuring society's benefit? Justify your opinion with example. 10 (CO3) (PO8)
- b) You are given the following information to estimate the decision options. 15 (CO2) (PO8)

Cost	Make option	Buy option
Fixed Cost	\$25,000	\$3,000
Variable cost	\$8	\$12

Use graphical presentation to answer the following questions.

- i. Find the break-even quantity and the total cost at the break-even point.
 - ii. If the requirement is 4,500 units, is it more cost-effective for the firm to buy or make the components? What is the cost saving for choosing the cheaper option?
 - iii. If the requirement is 6,000 units, is it more cost-effective for the firm to buy or make the components? What is the cost saving for choosing the cheaper option?
6. a) Differentiate between outsourcing and offshoring with example. 04 (CO1) (PO1)
- b) Steamy Speedboats has an annual demand for **1,500** speedboats. Its supplier offers quantity discounts to promote larger order quantities. The cost to place an order is **\$300**, and the holding rate is **32 percent** of the purchase cost. The purchase cost for each speedboat is based on the price schedule given below: 21 (CO2) (PO8)

Order Quantity	Price per unit
1 - 50	\$ 18,500
51 - 100	\$ 18,000
101 - 150	\$ 17,400
151 and above	\$ 16,800

Compute the following with graphical presentation

- (i) Optimal order quantity for each price break
- (ii) Which option will be the least total annual inventory cost (calculate each price breaks total cost)

Finally, what is the optimal order quantity (EOQ) that will minimize the total annual inventory cost? And what is the total annual inventory cost that will be efficient to choose for the company? Why?