

UNIVERSITY OF GREATER MANCHESTER
GREATER MANCHESTER BUSINESS SCHOOL
BSC (HONS) BUSINESS MANAGEMENT
SEMESTER TWO EXAMINATION 2024/2025
LOGISTICS AND OPERATIONS MANAGEMENT
MODULE NO: BMP6041

Date: Friday 16 May 2025

Time: 10.00 – 12.00

INSTRUCTIONS TO CANDIDATES:

There are four questions. Each question is worth 25 marks. Students have to answer ALL FOUR questions.

Use calculator for mathematical calculations. A list of formulae is provided in the appendices at the end of the examination paper.

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Question 01

Group the KPIs from table below into respective activities/departments based on Logistics Performance.

Activities/departments	KPIs
Order Management	Inventory to sales (vs fulfilled sales) Trailer utilisation rate Capacity utilisation Order flexibility Delivery time (on-time delivery)
Production	Perfect order Order fill capacity Delivery time flexibility Average days late
Inventory	Truck turnaround time Customer backorder rate Inventory accuracy Shipping time
Distribution	Order accuracy Average waiting time Freight payment accuracy
Transport Management	Transportation costs Productivity Pick and pack cycle time Inventory turnover (stock rotation)

[Total 25 marks]

Question 02

A) What is global logistics. [5 marks]

B) Identify and explain 5 external factors that influence sustainable global logistics decisions within an organisation. Discuss with examples. [20 marks]

[Total 25 marks]

Please turn the page.

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Question 03

- A) Explain the role of digital transformation in Logistics Management. [5 marks]
- B) Identify and explain 4 emerging technologies to improve warehouse logistics with relevant examples? [20 marks]

[Total 25 marks]

Question 04 – Scenario Question

Metro Logistics operates a regional distribution warehouse that supplies products to retailers. The company has been experiencing inefficiencies in order fulfilment and transportation operations and is now evaluating its performance for the last quarter. The following data is available:

- Total number of orders received = 10,500
- Total number of orders shipped on time = 8,750
- Total number of orders fulfilled completely = 9,200
- Total number of orders fulfilled completely and on time = 7,210
- Total inventory at the beginning of the quarter = 300,000 units
- New inventory received during the quarter = 200,000 units
- Total units shipped to retailers in previous quarter = 450,000 units
- Forecasted total unit shipments to retailers for the year = 1,650,000 units
- Total trailer capacity for outbound shipments = 250,000 cubic feet
- Total actual trailer space utilised = 210,000 cubic feet
- Total number of truck shipments completed = 900
- Total loading and unloading hours = 4,500 hours

- A) Calculate the On-Time Delivery performance rate for Metro Logistics. [2 marks]
- B) Discuss how they could improve the performance, if On-Time Delivery performance rate is less than 95%. [5 marks]
- C) Calculate the Perfect Order performance rate based on accurate and on-time order fulfilment. [2 marks]
- D) Discuss how they could improve the performance if it is less than 90%. [5 marks]
- E) What is the expected Inventory Turnover Ratio for the year? [5 marks]
- F) Evaluate the Trailer Utilisation Rate for outbound shipments. [3 marks]
- G) Calculate the Truck Turnaround Time per shipment. [3 marks]

[Total 25 marks]

END OF QUESTIONS

Please turn the page for Appendices

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Appendices

List of Formulae :

- Trailer Utilisation =
$$(\text{Actual Trailer Space Used} / \text{Total Trailer Capacity})$$
- Order Accuracy =
$$(\text{Accurate Deliveries} / \text{Total Deliveries})$$
- Freight Cost per kg (£/kg) =
$$\text{Total Transportation Cost} / \text{Total Weight of Shipments}$$
- On-Time Delivery Rate (%) =
$$(\text{On-Time Deliveries} / \text{Total Orders}) \times 100$$
- Fleet Efficiency (km per vehicle) =
$$\text{Total Distance Covered} / \text{Total Number of Vehicles Used}$$
- Order Fill Rate (%) =
$$(\text{Orders Fulfilled Completely} / \text{Total Orders Received}) \times 100$$
- Truck Turnaround Time (hours per shipment) =
$$\text{Total Loading and Unloading Hours} / \text{Total Truck Shipments}$$
- Customer Backorder =
$$(\text{Total Backordered Items} / \text{Total Items Ordered})$$
- Perfect Order Rate (%) =
$$(\text{Orders Fulfilled Completely \& On Time} / \text{Total Orders}) \times 100$$
- Average Days Late per Delayed Order =
$$\text{Total Delay Days} / \text{Total Late Orders}$$
- Inventory Turnover Ratio =
$$\text{Total Units Shipped} / \text{Average Inventory}$$
- Labour Productivity (Orders per Hour) =
$$\text{Total Orders Processed} / \text{Total Warehouse Labor Hours}$$

END OF APPENDICES