UNIVERSITY OF GREATER MANCHESTER

GREATER MANCHESTER BUSINESS SCHOOL

MSC LOGISTICS AND SUPPLY CHAIN MANAGEMENT

SEMESTER 2 EXAMINATION 2024/2025

LOGISTICS MANAGEMENT

MODULE NO: SCM7102

Date: Friday 16 May 2025 **Time: 10.00 – 1.00**

INSTRUCTIONS TO CANDIDATES:

There are five questions. Each question is worth 25 marks. Students have to answer ANY FOUR questions.

A list of formulae is provided in the appendices at the end of the examination paper.

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Question 1

A) Group the KPIs from table below into respective Management based on Logistics Performance. [15marks]

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

B) Explain techniques (two each) to improve each KPIs within Production management to improve logistics Performance. [10 marks]

[Total 25 marks]

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Question 2

A) Define global logistics with example? [5 marks]

B) Identify 5 external factors that affect global logistics decisions within an organisation and discuss a technique to overcome each external factor with relevant examples. [2010 marks]

[Total 25 marks]

Question 3

A) Explain unitisation in logistics? [5 marks]

B) Identify and explain 5 types of unitisations in logistics with its relevant use within logistics. [2015marks]

[Total 25 marks]

Question 4

A) Compare and analyse with examples five different modes of transport in logistics management based on each performance from the table 1 provided.

Table 1: Modes of transportation in terms of key supply chain performance metrices (Note: 5- best/cheapest, 1- worst/high)

Transportation	Cost	Speed	Reliability	Capability	Flexibility
Air	1	5	2	2	3
Truck	2	4	4	3	5
Rail	3	2	3	4	4
Water	5	1	1	5	2
Pipeline	4	3	5	1	1

[Total 25 marks]

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Question 5 – Scenario Question

At the headquarters of ABC Retailers, the logistics team gathered in the conference room for their monthly performance review. With their central warehouse supplying multiple regional distribution centres (RDCs), efficiency and productivity were always under scrutiny. The team was eager to assess their performance and identify areas for improvement.

David, the Warehouse Manager, kicked off the discussion by mentioning: "*This month, we started with 120,000 units of inventory, and we received an additional 80,000 units from our suppliers. By the end of the month, we successfully shipped 85,000 units to our RDCs.*"

Emma, the Operations Analyst, took over and explained: "*We processed 70,000 orders in total, ensuring that 56000 of them were fulfilled completely without any missing items. That leaves us with some inaccuracies that we will need to address*". The conversation then shifted to transportation efficiency, where Alex, the Logistics Supervisor, provided an update by explaining: "*Our total outbound trailer capacity across all shipments was 100,000 cubic feet, but we only utilised 85,000 cubic feet of that space. That is something we need to optimise*."

James, the Fleet Coordinator, looked at delivery efficiency and explained that: "*Over the past month, we completed 350 truck deliveries. Meanwhile, our warehouse team spent a total of 1,750 hours loading and unloading trucks, which gives us an indication of our truck turnaround time*". As, the discussion continued, Emma pointed out a key performance goal by mentioning: "*If we aim to improve our Trailer Utilisation Rate to 90%, we need to calculate exactly how much additional volume needs to be loaded into trailers without increasing the total capacity*."

With all the figures laid out, the team prepared to dive into calculations and formulate an action plan as they plan for digital transformation with emerging technologies. ABC Retailers was committed to improving efficiency, reducing wasted space in trailers, and ensuring higher order accuracy—all critical steps in enhancing their supply chain operations. The next month's report would show whether their strategies had paid off. They approached you for analysis. Now you are required to answer the following:

Question 5 continues over the page

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Question 5 continued

A) Calculate the Inventory Turnover Ratio for the warehouse.

[2 marks]

B) Calculate the Order Accuracy Performance Rate for orders processed.

[2 marks]

C) Evaluate the Truck Turnaround Time based on working hours spent on loading/unloading.

[2 marks]

D) If ABC Retailers aims to improve Trailer Utilisation Rate to 90%. Determine the Trailer Utilisation Rate for outbound shipments and further evaluate how much additional volume of goods must be loaded into trailers without increasing total trailer capacity.

[4 marks]

E) As part of improving Inventory turnover ratio to 90% and Order accuracy rate to 95%, you are required to recommend two emerging technologies (two for each - inventory turnover ratio and order accuracy rate) and justify your recommendations with examples.

[15 marks]

[Total 25 marks]

END OF QUESTIONS

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Appendices

List of Formulae :

- Inventory Turnover Ratio =
  Total Units Shipped / Average Inventory

- Trailer Utilisation =
  (Actual Trailer Space Used / Total Trailer Capacity)

- Order Accuracy =
  (Total Correct Orders / Total Orders Processed)

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- Truck Turnaround Time (hours per delivery) =
  Total Loading/Unloading Hours / Total Deliveries

- Perfect Order Rate =
  (Orders Delivered on Time & Accurate / Total Orders)

- Customer Backorder Rate (%) =
  (Total Backordered Items / Total Items Ordered) × 100

- Freight Cost Productivity (£/kg) =
  Total Transportation Cost / Total Weight of Shipments

- Required Additional Volume for Trailer Utilization (%) =
  (New Target Utilisation Rate × Total Trailer Capacity) - Actual Trailer Space Used

- Required Additional Fulfilled Items for Target Backorder Rate =
  (Target Backorder Rate × Total Items Ordered) - Current Backordered Items

- Note: Any performance rate (%) = relevant value x 100

END OF APPENDICES

END OF EXAM