



**K. K. Wagh Institute of Engineering Education & Research, Nashik**  
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:III
Class:PG-II	Program:MBA
Branch Code:10	Pattern:2024
Name of Course:Supply Chain Analytics	Course Code:2410611D
Max. Marks:60	Duration:2.30 Hrs.

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 2 pages.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

**Marks CO**

**Question No. 1**

- 1a) Identify three key issues in SCM (e.g., supplier volatility, inventory bottlenecks, routing inefficiencies) and suggest analytics-based or lean solutions for each. (6) CO1

**Question No. 2**

- 2a) Define sustainable supply chain management and outline key practices. (6) CO2

**Question No. 3**

- 3a) GreenLogistics Co., a sustainable packaging firm, sources materials from South America, manufactures in North America, and distributes globally. Amid rising trade tariffs (political factor), 6% inflation (economic), stricter carbon regs (environmental), tech advances in AI routing (technological), shifting consumer eco-preferences (social), and legal traceability mandates (legal), internal audits show strengths in green certifications but weaknesses like 18% excess inventory, opportunities in nearshoring, and threats from supplier disruptions. The SC team must use analytics-enhanced SWOT and PESTLE to refine strategy alignment. (8) CO3

Question

Conduct a SWOT analysis/PESTLE analysis impacting GreenLogistics' SC.

**OR**

- 3b) Explain the supply chain strategy process in detail and role of analytics in it. (8) CO3
- 3c) What is an SC vision? What typically are the key elements of an SC vision? How can an SC vision be developed? (8) CO3

**OR**

- 3d) Explain the supply chain design process in detail and role of analytics in it. (8) CO3

**Question No. 4**

- 4a) FreshMart, a regional grocery chain, sources perishable produces from farms, processes at a central plant, and fulfills orders via three distribution centers (DCs) amid peak holiday demand. Order fulfillment involves receiving (200 orders/hr capacity), picking (150 orders/hr bottleneck), packing (180/hr), and shipping (220/hr), with 30% stockouts and average lead time of 48 hours despite 80% (8) CO4

overall capacity utilization. Internal audits reveal picking as the constraint due to manual scanning across 10,000 SKUs.

Suggest a suitable model for the above problem. Provide a technology assisted solution for the same.

**OR**

- 4b) Explain the supply chain execution process in detail and role of analytics in it. (8) CO4
- 4c) RefreshCo distributes soft drinks from two Texas plants (Plant A: 500 tons capacity, Plant B: 300 tons) to 25 Dallas-Fort Worth retailers with varying demands and shipping costs per ton (e.g., higher from B to distant stores). Current fixed allocations cause 20% idle plant capacity and uneven delivery costs. (8) CO4

Formulate as a Simple Linear Programming (LP) Transportation Model.

**OR**

- 4d) Explain the Supplier analysis process – categorise the supply base. (8) CO4

**Question No. 5**

- 5a) What are the four SC people sub-processes and which analytic techniques can be used to improve them? (8) CO5

**OR**

- 5b) Using an example to help with your explanation, show how Markov analysis can be used to help solve everyday SC people challenges. (8) CO5
- 5c) A retail chain evaluates three warehouse locations for expansion using criteria like proximity to markets, construction cost, labor availability, and environmental impact, where data includes linguistic terms like "close proximity" or "high labor costs" from site surveys. Students must recommend the optimal MCDM model without calculations. (8) CO5

**OR**

- 5d) With the aid of an example, describe how assignment models work and how they can be applied to optimise human resource allocations. (8) CO5

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