

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Fourth Semester MBA Degree Examinations, August 2026

MULTI-MODAL LOGISTICS FOR PORTS AND AIRPORTS

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FOUR full questions from Question No. 1 to 7.

2. Question No. 8 is compulsory

3. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PO)</u>
1	a. Define multi-modal transportation	03	(3:1:1)
	b. Apply the Pros and Cons of multi-modal transportation	07	(3:1:2)
	c. Analyse the role of sea ports and air ports in multi-modal transportation.	10	(4:1:3)
2.	a. Discuss the importance of sea ports.	03	(3:2:1)
	b. Apply the phases of port development.	07	(3:2:2)
	c. Analyse the maritime and administrative functions of sea ports.	10	(4:2:3)
3.	a. Define the governance of ports and describe what it involves.	03	(3:3:1)
	b. Explain seaport administration, ownership and management in terms of responsibilities, functions and influencing factors.	07	(3:3:2)
	c. Analyse various challenges faced by port boards.	10	(4:3:3)
4.	a. Summarize the advantages and disadvantages of air transport and shipments.	03	(3:4:1)
	b. Classify IATA's 9 classes of dangerous goods.	07	(3:4:2)
	c. Explain the key steps of IATA cargo master operating plan.	10	(4:4:3)
5	a. Outline the mission of International Air Transport Association (IATA).	03	(3:5:1)
	b. Illustrate common air freight accessorial (additional) rates.	07	(3:5:2)
	c. Analyse the classification of air cargo rates.	10	(4:5:3)
6.	a. Explain port time and what it includes.	03	(3:5:1)
	b. Enlist different types of ships.	07	(3:5:2)
	c. Analyse the latest ship technologies.	10	(4:5:3)
7.	a. Outline the port types based on ownership.	03	(3:2:1)
	b. Analyse the key departments / staff in sea ports and their roles.	07	(3:2:2)
	c. Explain the developments in cargo / container handling and terminal operations.	10	(4:2:3)

Case Study

Jawaharlal Nehru Port Authority (JNPA)

JNPA is India's premier container gateway, handling approximately 54% of the total containerized cargo volume across all major Indian ports.

JNPA maintains deep-water berths (draught) to accommodate the largest container ships in the world. Harbour pilots guide ships into the port, while tugboats assist with docking at the wharves. Man-made structures like breakwaters protect the berthing areas from heavy waves, ensuring a stable environment for loading and unloading. Massive quay cranes lift containers off ships and transfer them to "straddle carriers" or trailers. JNPA acts as a "bridge" between different transportation modes. Efficient rail and highway connections at JNPA allow goods to reach distant factories and distribution centres, making the port a vital "value-adding transit point" in the supply chain. JNPA has large "backup areas" or container yards where goods are stored temporarily before being cleared for their next destination. The port management coordinates with private terminal operators to ensure safety, security, and environmental standards (the "landlord model")

JNPA has evolved into a "Smart Port" by integrating advanced digital infrastructure to streamline operations and reduce "turnaround time" for vessels with the help of Automation Systems such as Navis N4 Terminal Operating System that manages complex yard operations and vessel planning with high precision, Radio Frequency Identification (RFID) Gate Automation that reduces gate transaction times from 10 minutes to just 1 minute, and the SagarSetu (NLP-Marine) platform, which allows paperless exchange of documents between ships, customs, and port authorities, potentially reducing waiting times by up to 40%. In addition, use of PCS 1x, an upgraded Indian Port Community System helps as a single communication point for 27 different maritime stakeholders, eliminating duplicate paperwork. Also with the introduction of Logistics Data Bank (LDB), JNPA pioneered the use of IoT-based tracking, allowing exporters to track their goods in real-time.

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| a. | Comtemplate JNPT is managing multi-modal transportation. | 10 | (5:5:5) |
| b. | Design the steps taken by JNPA to enhance efficiency of its operations to attract shipping lines | 10 | (5:4:4) |

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