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:TPS and Industry 5.0	Course Code:2410612D
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)	Describe the "4P" model of the Toyota Way. Explain with examples on 'creating continuous process flow'.	(6)	CO1
Question No. 2			
2a)	Explain Principle 9 of the Toyota Way: "Grow leaders who thoroughly understand the work, live the philosophy, and teach it to others." Discuss how leaders embed long-term philosophy in manufacturing operations.	(6)	CO2
Question No. 3			
3a)	i) Differentiate between Lean Vs Agile Manufacturing. ii) Explain flexible manufacturing	(8)	CO3
	OR		
3b)	Compare Japanese approaches with Western methods. Evaluate their impact on efficiency, quality, and adaptability in modern factories.	(8)	CO3
3c)	Define Industry 4.0. Explain core pillars like smart factories and horizontal/vertical integration, with example.	(8)	CO3
	OR		
3d)	Review the journey of Industry 5.0 in developed countries (EU's human-centric model, Japan's Society 5.0)	(8)	CO3
Question No. 4			
4a)	Define IoT, and IIoT. Explain their roles in smart manufacturing/logistics.	(8)	CO4
	OR		
4b)	Describe the Reference Architectural Model Industry 4.0 (RAMI 4.0) with its three dimensions (hierarchy levels, IT layers, lifecycle/value stream).	(8)	CO4

4c)	Consider a retail company that collects customer data for better decision- making. Analyze how each of the 4 Vs of big data (Volume, Velocity, Variety, and Veracity) applies to their data collection and utilization processes. Provide practical examples for each V."	(8)	CO4

OR

4d)	Anticipate the resource-based view of firm and importance of Data as a new source for organization with suitable examples.	(8)	CO4

Question No. 5

5a)	Differentiate between traditional industrial robots and collaborative robots (cobots) in terms of design, safety, programming, flexibility, and typical applications. Explain how these differences influence their suitability for modern smart factories.	(8)	CO5

OR

5b)	A Dutch tomato grower at Wageningen University pilots AI-human teams using drone IoT for real-time soil analytics and cobot harvesting, boosting yields 25% while cutting water use 30%. Discuss Agri 5.0 ecosystem: upskilled farmers with mobile dashboards, circular hydroponics, and resilient pest prediction. Evaluate worker empowerment vs. traditional labor-intensive farming.	(8)	CO5
5c)	Define Cyber-Physical Systems (CPS) and outline their key characteristics.	(8)	CO5

OR

5d)	Explain in detail LEAD and TIER Framework with examples.	(8)	CO5

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