

PRN No.	
---------	--

PAPER CODE	U325-21P4BCE
------------	--------------

**(AY:2024-25) May 2025 (ENDSEM) EXAM
TY (SEMESTER - II)**

COURSE NAME:
Digital Manufacturing & Automation

Branch: Mechanical COURSE CODE: MEUA32204R1B

(PATTERN 2020R1)

Time: [1Hr 30 Min]

[Max. Marks: 40]

(* Instructions to candidates:

- 1) **Figures to the right indicate full marks. Use of scientific calculator is allowed**
- 2) **Use suitable data wherever required**
- 3) **All questions are compulsory. Solve any two-sub question each from Questions 1 and 2**
- 4) **Solve any one sub question (2 marks) from Questions 3 ,4 ,5 and 6 and sub question of 4 marks is compulsory from questions 3,4,5,and 6**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Apply the knowledge to interpret how the Internet of Things (IoT) can automate manufacturing processes.	[4]	1	3
	b) Relate the transformative potential of industrial robots in automating manufacturing processes	[4]	1	3
	c) Quantify the significance of Industry 4.0 technologies in terms of different costs.	[4]	1	3
Q2	a) Enlist steps involved in big data analytics process and state their applications.	[4]	2	3
	b) State the importance of any two Industry 4.0 technologies in the context of digital manufacturing	[4]	2	3
	c) Make use of virtual reality and develop one project where manufacturing companies can reduce their resources.	[4]	2	3
Q3	a) Explain the significance of digital technologies in achieving the objectives of circular economy. OR	[2]	3	2
	b) Extend the discussion on how circular economy principles can enhance productivity. Any two.	[2]	3	2
	c) Demonstrate a case study of a company who have adopted sustainable business models	[4]	3	3
Q4	a) Demonstrate a training program to upskill workers whose jobs are threatened by automation in a manufacturing setting OR	[2]	4	2

	b) Outline some examples of jobs that are at risk of displacement due to increased automation.	[2]	4	2
	c) Extend discussion on how green manufacturing practices can contribute to sustainability in Industry 4.0.	[4]	4	3
Q.5	a) Explain the principles of Design for Manufacturing (DFM) to optimize the manufacturability of a product OR	[2]	5	2
	b) Solve the problem to determine design efficiency when 11 essential parts and 30 bought out parts.	[2]	5	2
	c) Develop a design concept for a product that incorporates both DFM and DFA principles to optimize manufacturing and assembly processes	[4]	5	3
Q.6	a) Discuss some emerging trends and future developments in Industry 4.0 that are likely to impact sustainability practices OR	[2]	6	2
	b) Construct a theory with implications on how do different countries and regions view Industry 4.0 and its impact on sustainable practices?	[2]	6	2
	c) Develop a plan to integrate Industry 4.0 technologies into a manufacturing process to improve sustainability metrics, such as energy efficiency or waste reduction	[4]	6	3

*Note- BT level: 1-Remember, 2-Understand, 3-Apply, 4-Analyse, 5-Evaluate, 6-Create.