Reg. No. ☐☐☐☐☐☐☐☐☐☐☐☐☐

M.E / M.TECH. DEGREE EXAMINATIONS, MAY 2023

Second Semester

IR22202 – CONCEPTS OF INDUSTRY 4.0

(Industrial Automation and Robotics)

(Regulation 2022)

TIME: 3 HOURS   **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Understand different components of I4.0 and its benefits	2
CO 2	Understand the importance of AI and Big data analytics in modern industry	2
CO 3	Visualize the complete factory layout and processes by simulation, AR/VR	3
CO 4	Be Exposed to real time autonomous robot and its applications	3
CO 5	Gain knowledge about Cloud technology and its benefits	2

PART- A (20 x 2 = 40 Marks)
(Answer all Questions)

		CO	RBT LEVEL
1.	Differentiate between cyber world and physical world.	1	2
2.	Name few wireless sensor networks.	1	2
3.	With an appropriate application explain RFID.	1	2
4.	Explain how mobile network works.	1	2
5.	Elaborate the term AI.	2	2
6.	What are called Intelligent agents?	2	2
7.	Elaborate data analysis with respect to AI.	2	2
8.	Explain the nature of Big data Analysis.	2	2
9.	Why additive manufacturing cannot be used for process industries?	3	3
10.	How does the scheduling of goods is optimized using technologies?	3	3
11.	What significance does Augmented reality possess in Industry 4.0?	3	3
12.	Brief about limitations and constraints in layout optimization.	3	3
13.	Under what conditions robots are classified as mobile robots?	4	3
14.	Name few applications of Autonomous robots.	4	3
15.	List down 5 basic sensors used in IoT.	4	3
16.	What does LPWAN refers to?	4	2
17.	Identify the need for Cloud.	5	2
18.	Elaborate on cyber security.	5	2
19.	Explain the term System Integration.	5	2
20.	What is meant by cloud models?	5	2

PART- B (5 x 10 = 50 Marks)

		Marks	CO	RBT LEVEL

21. (a) Elaborate the domains of applications of cyber-physical system and what are the components of cyber-physical system. **(10)** **1** **3**

(OR)

(b) Discuss about the wireless sensor network with an application and how RFID could be integrated. **(10)** **1** **3**

22. (a) Explain the different characteristics of intelligent agents with appropriate diagram. **(10)** **2** **3**

(OR)

(b) Elaborate the different problem-solving methods for AI problems. Also explain about Big data platforms. **(10)** **2** **3**

23. (a) Identify the need for Additive manufacturing in product development and what are the different classifications? **(10)** **3** **3**

(OR)

(b) Differentiate in detail between AR and VR with their fundamental concepts and primary features. **(10)** **3** **3**

24. (a) Classify the different types of autonomous robots with industrial applications and appropriate diagram. **(10)** **4** **3**

(OR)

(b) Elaborate about IIoT Architecture and the parameters for design consideration in industries. **(10)** **4** **3**

25. (a) Explain cloud computing and cloud-based services with industrial applications. **(10)** **5** **3**

(OR)

(b) Explain with an industrial case about horizontal and vertical integration. **(10)** **5** **3**

PART- C (1 x 10 = 10 Marks)

(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL

26. With increasing cyber-attacks in various forms, elucidate the steps to counter them in developing a cyber-physical system for a food delivery company. **(10)** **1** **5**