Reg. No.

M.E / M.TECH. DEGREE EXAMINATIONS, MAY 2024
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	3
CO 3	Visualize the complete factory layout and processes by simulation, AR/VR	2
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.	Name any four components of Industry 4.0.	1	2
2.	Define the term Digital twin.	1	2
3.	Justify the term "Interoperability is the key for digital twin".	1	3
4.	What do you mean by Cyber-Physical System in the context of medical system?	1	2
5.	Enumerate the term Cognition in an agent.	2	2
6.	Name the different AI approaches in Industry 4.0 application.	2	3
7.	Define big data reporting.	2	3
8.	Classify the three types of big data analytics.	2	2
9.	Additive manufacturing is apt for product realization - Justify	3	3
10.	In what way additive manufacturing is applied in an automobile industry?	3	2
11.	Differentiate Simulation and Augmented reality.	3	2
12.	Enumerate the role of Virtual reality in modern industries.	3	2
13.	Define the term Network.	4	3
14.	What are the 4 central elements of industrial Internet?	4	3
15.	Name any two controllers used in IIoT.	4	2
16.	How many stages are there in IIoT architecture and name them?	4	3
17.	Define SAAS.	5	2
18.	Describe the Fog computing technology.	5	2

		Marks	CO	RBT LEVEL
19.	Cyber security is the core of e-commerce activity – Justify.	5	3	
20.	What do you mean by cyber-attack?	5	2	

PART- B (5 x 10 = 50 Marks)

			Marks	CO	RBT LEVEL
21. (a)		Elucidate the step by step procedure to adopt the technology of Industry 4.0.	(10)	1	3
		(OR)			
(b)	(i)	Classify the different types of data's? Explain the role of UML diagram to restrict the level of accessibility.	(7)	1	3
	(ii)	Explain the term Scalability in Cyber-physical system?	(3)	1	3
22. (a)		What is the role of machine learning in data analytics? Explain the types of machine learning methods.	(10)	2	3
		(OR)			
(b)		Explain the working of Artificial Neural Network (ANN) in the context of unsupervised learning along with an application.	(10)	2	3
23. (a)		Explain the different techniques of additive manufacturing with respect to the surface texture.	(10)	3	3
		(OR)			
(b)		Briefly elaborate the functions of mixed reality while simulating a real world system.	(10)	3	3
24. (a)		Describe the functioning of Cobots with its significance and applications in medical application.	(10)	4	3
		(OR)			
(b)		What are the design considerations of IIoT architecture with real time data collection?	(10)	4	3
25. (a)		Differentiate between IAAS and PAAS cloud system with respect to its application.	(10)	5	3
		(OR)			
(b)		Briefly explain the role of cyber security in IIoT application.	(10)	5	3

PART- C (1 x 10 = 10 Marks)
(Q.No.26 is compulsory)

		Marks	CO	RBT LEVEL
26.	An automobile company has a large data set and wishes to apply data analytics philosophy to draw certain decisions. Suggest suitable supervised learning method and explain the steps involved to train the data. Also comment whether the unsupervised learning methods can be used to evaluate the big data.	(10)	2	5

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