Question Paper Code | **13223**

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Seventh Semester

Electronics and Instrumentation Engineering
20ICEL703 - INDUSTRIAL INTERNET OF THINGS

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)
Answer ALL Questions

		Marks	K–Level	CO
1.	Fill in the blanks. The speed of Internet is represented by _____.	1	K1	CO1
	(a) dpi (b) GHz (c) Gbps (d) GB			
2.	What is KPI in the context of performance management?	1	K1	CO1
	(a) Key Product Index (b) Key Performance Indicator			
	(c) Key Performance Index (d) Key Product Identifier			
3.	Which of the following is not an impact of the Lean production system on manufacturing?	1	K1	CO1
	(a) Highest lead time (b) Low cost (c) High quality (d) All of the above			
4.	How many components are there in PLM that are used to handle a product across its lifetime?	1	K1	CO1
	(a) 3 (b) 5 (c) 7 (d) 9			
5.	Which of the following is a feature of Amazon Smart Warehousing's logistics and supply chain management?	1	K1	CO2
	(a) Manual control of supply fleet			
	(b) Logistic status update with future market demand			
	(c) Centralized customer service			
	(d) Distributed parking and space surrounding control			
6.	What does conversion refer to in context of CPS architecture for IIoT?	1	K1	CO2
	(a) Conversion of CPS into individual components.			
	(b) Conversion of machine data to meaningful information.			
	(c) Conversion of present data into future data prediction.			
	(d) Conversion of analog signal to digital signal.			
7.	Select the statement which describes one of the limitations of smart sensors.	1	K1	CO2
	(a) Sensor data aggregation not possible (b) Cannot connect with an actuator			
	(c) Cannot connect to a network (d) All of the above			
8.	What is projection-based AR?	1	K1	CO2
	(a) It gives outcomes by projecting light on real world surfaces.			
	(b) It substitutes the original view with of an object with the augmented view.			
	(c) It gives the output when a marker is detected.			
	(d) It is used for GPS-denied regions			
9.	Which of the following protocol falls under the category of Industrial Ethernet??	1	K1	CO3
	(a) CC-Link (b) Device Net			
	(c) Time-Sensitive Networking (TSN) (d) Interbus			
10.	What is the full form of Profinet?	1	K1	CO3
	(a) Preplanned Field Network (b) Process Figured Network			
	(c) Preplanned Figured Network (d) Process Field Network			
11.	Which of the following network topology/(ies) is/are not supported by EtherCat?	1	K1	CO3
	(a) tree (b) hybrid (c) star (d) mesh			
12.	What is the maximum data rate per packet of EtherNet/IP?	1	K1	CO3
	(a) 500 bytes (b) 100 bytes (c) 1500 bytes (d) 2000 bytes			

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. What is the subfield of machine learning that mimics the working function of billions of neurons in our brain?   *1*   *K1*   *CO4*
    (a) Regression   (b) Deep Learning   (c) Decision tree   (d) Reinforcement learning
14. Why do we need cloud?   *1*   *K1*   *CO4*
    (a) For high computational speed for data monitoring and analytics
    (b) For storage of huge amount of data
    (c) For effective data acquisition
    (d) All of the above
15. Amazon Web Service is a _____ cloud.   *1*   *K1*   *CO4*
    (a) public   (b) private   (c) hybrid   (d) community
16. Which one of the following is not a characteristic of a good SLA?   *1*   *K1*   *CO4*
    (a) Mutually Acceptable   (b) Quantifiable   (c) Refundable   (d) Controllable
17. IIoT-enabled healthcare infrastructure can facilitate the monitoring of patient's health conditions remotely. State true or false.   *1*   *K1*   *CO5*
    (a) True   (b) False
18. _____ develops continuous glucose monitoring devices. Fill in the blanks.   *1*   *K1*   *CO5*
    (a) Dexcom   (b) iHealth BP5
    (c) Kinsa smart thermometer   (d) ADAMM Intelligent Asthma Monitoring device
19. "ADAMM Intelligent Asthma Monitoring device predicts pre symptoms of asthma attack from the body temperature, cough rate, heart rate." State true or false.   *1*   *K1*   *CO5*
    (a) True   (b) False
20. Which of the following represents the benefits of the digital power plant?   *1*   *K1*   *CO5*
    (a) Decreased efficiency   (b) Increased cost
    (c) Improvement in performance   (d) Increase in energy requirement

PART - B (10 × 2 = 20 Marks)
Answer ALL Questions

21. What are different communication protocols?	*2*	*K1*	*CO1*
22. Differentiate between different types of Revolution.	*2*	*K2*	*CO1*
23. Give the uses of Big Data Analytics for Industry 4.0.	*2*	*K1*	*CO2*
24. What is the main goal of PLM?	*2*	*K1*	*CO2*
25. Mention the advantages of WSAN.	*2*	*K1*	*CO3*
26. What are the different challenges that are faced by industrial processes?	*2*	*K2*	*CO3*
27. Differentiate between K -Means and fuzzy-c Means algorithm.	*2*	*K2*	*CO4*
28. List the Various industries utilizing IIoT with Machine Learning.	*2*	*K1*	*CO4*
29. What is the need for Software Security?	*2*	*K1*	*CO5*
30. List the application of IIOT in electricity sector.	*2*	*K2*	*CO5*

PART - C (6 × 10 = 60 Marks)
Answer ALL Questions

31.	a)	Classify different type of sensors. Explain in detail.	*10*	*K2*	*CO1*
		OR			
	b)	What is Lean Production System? Explain about different types of wastes.	*10*	*K2*	*CO1*
32.	a)	Explain the Ten Step Approach followed in PLM solution in Industry 4.0.	*10*	*K1*	*CO2*
		OR			
	b)	Describe how Augmented Reality works does.	*10*	*K1*	*CO2*
33.	a)	Explain the different types of IIoT new business models.	*10*	*K2*	*CO3*
		OR			
	b)	Illustrate any two commonly used industrial sensors in detail.	*10*	*K2*	*CO3*

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **13223**

34.	a)	Explain IIOT Analytics in machine learning.	10	K2 CO4
		OR		
	b)	Discuss the architecture of SDN.	10	K2 CO4
35.	a)	Explain the application of IOT in chemical industry.	10	K2 CO5
		OR		
	b)	What are the challenges and requirements of healthcare in IIOT?	10	K2 CO5
36.	a) i)	Describe about Hadoop distributed File system.	5	K2 CO4
	ii)	Examine the smart grid power system.	5	K2 CO5
		OR		
	b) i)	Interpret the IIOT Analytics with aircraft application.	5	K2 CO4
	ii)	Describe about Inventory Management & Quality Control.	5	K2 CO5