

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

B.Tech (Electronics and Communication Engineering) SEMESTER - 6 Summer 2025 (Regular)

Course :Bachelor of Technology (Electronics and Communication Engineering) Branch : Engineering and Technology

Semester : SEMESTER - 6

Subject Code & Name: BTETOE604A - IOT AND INDUSTRY 4.0

Time : 3 Hours]

[Total Marks : 60

Instructions to the Students:

1. Each question carries 12 marks.
 2. Question No. 1 will be compulsory and include objective-type questions.
 3. Candidates are required to attempt any four questions from Question No. 2 to Question No.6
 4. Use of non-programmable scientific calculators is allowed.
 5. Assume suitable data wherever necessary and mention it clearly.
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Q1. Objective type questions. (Compulsory Question) 12

- 1 What is the primary function of a sensor in Industry 4.0 systems?
 - A) To process data and generate reports
 - B) To monitor and collect data from the environment
 - C) To control mechanical operations
 - D) To transmit signals wirelessly
- 2 What is a key characteristic of Cyber-Physical Systems (CPS) in Industry 4.0?
 - A) They operate independently of software
 - B) They only function in cloud environments
 - C) They tightly integrate computational and physical processes
 - D) They are used only for simulation purposes
- 3 Which of the following best defines Big Data Analytics in Industry 4.0?
 - A) Analyzing large datasets to support predictive maintenance and optimization
 - B) A cloud storage service for sensor data
 - C) Real-time image capturing for quality control
 - D) Manual data entry and reporting
- 4 What is the primary goal of implementing IIoT in industrial processes?
 - A) Replacing all human workers
 - B) Automating financial transactions
 - C) Enhancing productivity, efficiency, and predictive maintenance
 - D) Reducing internet speed
- 5 Which layer of the IIoT architecture is responsible for acquiring real-time data from machines?
 - A) Processing Layer
 - B) Application Layer
 - C) Sensing Layer
 - D) Business Layer
- 6 In IIoT, digital twins are used for
 - A) Creating physical backup machines
 - B) Representing physical assets digitally for simulation and analysis
 - C) Performing manual diagnostics
 - D) Managing customer service
- 7 Which communication protocol is often used in IIoT for lightweight messaging between devices?
 - A) FTP
 - B) HTTP
 - C) MQTT
 - D) SMTP

- 8 What is the main advantage of using Software Defined Networking (SDN) in IIoT systems?
 - A) Reduced device compatibility
 - B) Centralized network control and dynamic configuration
 - C) Increase in hardware complexity
 - D) Reduced network scalability
- 9 In machine learning for IIoT analytics, what is supervised learning?
 - A) Learning without labeled data
 - B) Real-time learning on the edge
 - C) Learning with labeled input-output pairs for training
 - D) Only using cloud services for learning
- 10 Which of the following best defines Fog Computing in the context of IIoT?
 - A) Centralized computing in remote data centers
 - B) Computing done exclusively on end devices
 - C) Distributed computing closer to the data source, between edge and cloud
 - D) Wireless sensor network architecture
- 11 Which of the following is not typically a security concern in IIoT systems?
 - A) Device spoofing
 - B) Unauthorized access
 - C) Sensor calibration
 - D) Denial of Service (DoS) attacks
- 12 In the food industry, how does IIoT contribute to quality assurance?
 - A) By reducing automation
 - B) Through manual inspection processes
 - C) Through real-time monitoring of temperature, humidity, and hygiene parameters
 - D) By outsourcing production

Q2. Solve the following.

- A) Explain how global digital transformation and emerging technologies are reshaping industries under the influence of Industry 4.0. 6
- B) Describe the significance of Cyber-Physical Systems (CPS) in Industry 4.0. 6

Q3. Solve the following.

- A) Explain the main components of an IIoT Reference Architecture. 6
- B) Explain the importance of edge computing in the IIoT Processing Layer and what are its industrial advantages? 6

Q4. Solve Any Two of the following.

- A) Describe how Machine Learning enhances IIoT analytics. 6
- B) Describe the architectural components and working of IIoT Communication Layer Part III. 6
- C) Explain how data velocity, volume, and variety are handled using IIoT frameworks. 6

Q5. Solve Any Two of the following.

- A) Explain how Software Defined Networking (SDN) in IIoT improve network scalability, flexibility, and security in industrial environments? 6
- B) Explain the key security threats in Industrial IoT systems? 6
- C) Explain the importance of machine-to-machine (M2M) communication and data integration in factories and assembly lines. 6

Q6. Solve Any Two of the following.

- A) Explain the role of sensors, remote monitoring, and predictive analytics in patient care and hospital management. 6
- B) Describe the industrial applications of Unmanned Aerial Vehicles (UAVs). 6
- C) Explain the role of automation, sensor-based quality checks, and traceability in the dairy sector. 6

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