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Brainware University
398, Ramkrishnapur Road, Barasat
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BRAINWARE UNIVERSITY

Term End Examination 2024-2025

Programme – B.Tech.(CSE)-2023

Course Name – Internet of Things

Course Code - ESCG301

(Semester III)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Identify the layer responsible for host addressing and packet routing?
 - a) Link Layer
 - b) Transport Layer
 - c) Network Layer
 - d) Application Layer
- (ii) Identify the role of actuators in an IoT system?
 - a) Collect environmental data
 - b) Process and store data
 - c) Perform physical actions based on commands
 - d) Secure the communication between devices
- (iii) Recognize a key enabler of IoT from the following?
 - a) Cloud Computing
 - b) 4G
 - c) Edge Computing
 - d) Blockchain Technology
- (iv) Identify the IoT communication model that allows for direct communication between devices without a central server?
 - a) Publish-Subscribe
 - b) Peer-to-Peer
 - c) Client-Server
 - d) Request-Response
- (v) Recall the role of a gateway in an IoT architecture?
 - a) To collect data from sensors
 - b) To store data locally
 - c) To bridge communication between IoT devices and the cloud
 - d) To secure the IoT network
- (vi) Identify protocol commonly used for constrained devices and IoT applications due to its lightweight nature?
 - a) HTTP
 - b) FTP
 - c) CoAP
 - d) SMTP
- (vii) Identify the operational frequency band of ZigBee
 - a) 2.4 GHz
 - b) 5 GHz
 - c) 900 MHz
 - d) 3.5 GHz
- (viii) Identify the application that would benefit the most from using CoAP instead of HTTP?

- a) Real-time video conferencing
- c) Large-scale file transfer
- (ix) Describes the role of Cloud Computing in IoT?
 - a) It connects IoT devices to the internet.
 - c) It controls IoT devices remotely.
- (x) Recognize the statement that best describes Machine-to-Machine (M2M) communication in IoT?
 - a) Communication between devices without human intervention
 - c) Human-to-device communication
- (xi) Identify from the following an advantage of Wireless Sensor Networks (WSNs) in IoT?
 - a) High energy consumption
 - c) No scalability
- (xii) Identify the primary function of M2M communication in IoT?
 - a) Device management
 - c) Data storage
- (xiii) Identify the technology that plays a crucial role in industrial automation within IoT.
 - a) Blockchain
 - c) RFID
- (xiv) State one of the primary benefits of IoT in smart energy buildings?
 - a) Enhanced automation of energy systems
 - c) Reduced building size
- (xv) Identify the primary benefit of utilizing Big Data analytics in IoT applications.
 - a) Reducing hardware costs
 - c) Improving decision-making through real-time insights
- b) Sending small sensor data from IoT devices
- d) Email communication
- b) It provides the computational power and storage for IoT data.
- d) It enhances the security of IoT networks.
- b) Human-to-human interaction
- d) Device-to-cloud communication
- b) Low energy consumption
- d) Scalability and low power consumption
- b) Data sensing
- d) Data transmission
- b) M2M
- d) SCADA
- b) Higher initial setup costs
- d) Limited use of renewable energy
- b) Enhancing data storage capabilities
- d) Simplifying data transmission

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Discuss the challenges are associated with implementing SCADA in IoT, and how they can be addressed. (3)
3. Explain the significance of SCADA systems in industrial IoT applications. (3)
4. Describe three real-time applications of IoT with proper example. (3)
5. Describe the Merits and demerits of IoT. (3)
6. Analyze the benefits of using sensor networks in precision agriculture. (3)

OR

- Compare M2M communication with traditional communication methods highlighting the benefits of M2M. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Describe the physical design of IoT systems, focusing on the main components and their roles. (5)
8. Explain the architecture of bluetooth. (5)
9. Analyze the impact of 5G on the scalability and performance of IoT networks. Also conclude the improvements and challenges of 5G. (5)
10. Explain different characteristics of IoT. (5)
11. Analyze the benefits and challenges of using the Web of Things (WoT) for resource Identification and management compared to traditional IoT systems. (5)

12. Compare hierarchical and flat clustering methods in the context of IoT networks, highlighting their advantages and disadvantages. (5)

OR

Analyze the challenges of achieving scalability through clustering in IoT systems, especially in dynamic environments. (5)

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