Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination May-2023

CS3EL06 Internet of Things

Programme: B.Tech. Branch/Specialisation: CSE / All

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. What is the full form of the LPWAN? **1**

(a) Low Protocol Wide Area Network
(b) Low Power Wide Area Network
(c) Long Protocol Wide Area Network
(d) Long Power Wide Area Network

ii. What is an IoT network? **1**

(a) A collection of networked devices
(b) A collection of Interconnected devices
(c) A collection of signalled devices
(d) None of these

iii. One of the advantages of SDN-based sensor network is- **1**

(a) Real-time programmability
(b) No need to replace any node
(c) Both (a) & (b)
(d) None of these

iv. A networking architecture that separates the control plane from the data plane and centralizes the network controller is known as- **1**

(a) Software-Defined Networking
(b) Network-Function Virtualization
(c) Machine-to-Network
(d) Centralized Network Controller

v. "Consider a system where, a heat sensor detects an intrusion and alerts the security company." What kind of a requirement the system is providing? **1**

(a) Functional (b) Non-Functional
(c) Known Requirement (d) None of these

P.T.O.

vi. Which of the following is not an application of IoT? **1**
(a) Wearables (b) Smart Grid
(c) Arduino (d) Smart City

vii. Integrity in data security is- **1**
(a) Detecting unauthorized data modification
(b) Sending secure data to cloud
(c) Preserving the privacy of data
(d) None of these

viii. Which of the following is a disadvantage of IoT? **1**
(a) Increased efficiency and productivity
(b) Improved decision-making and analytics
(c) Privacy and security concerns
(d) Greater connectivity and collaboration

ix. What is a smart home in IoT? **1**
(a) A home that is equipped with IoT devices and systems
(b) A home that is powered by renewable energy sources
(c) A home that uses advanced security systems
(d) A home that is completely automated

x. Which is the example for smart grid edge device for utility? **1**
(a) Smart Meters (b) Smart Home
(c) Smart Car (d) Smart College

Q.2 i. Define sensor and actuator. **2**
ii. Discuss the significance of REST based communication API. **3**
iii. Draw and discuss the reference model of IoT. **5**
OR iv. What are the three main types of MQTT messages? Describe it. **5**

Q.3 i. What is Machine to Machine communication (M2M)? **2**
ii. Draw software-defined networking architecture and enlist the different models of SDN. **8**
OR iii. How does Cloud Computing and Big Data contribute to Internet of Things? **8**

Q.4 i. Explain issues in IoT security. **3**
ii. Draw and explain the purpose & requirements specification of an IoT application. **7**
OR iii. Explain information view, deployment, functional view, and operational view, other relevant architectural views of IoT reference architecture. **7**

Q.5 i. What are the common attacks on IoT and their existing countermeasures?? **4**
ii. Discuss the privacy, security, and trust in IoT-data-platforms in context of smart cities. **6**
OR iii. What are the features and challenges of IoT-based access control? **6**

Q.6 Attempt any two:
i. Enlist challenges faced by industry related IoT applications in detail. **5**
ii. How does home intrusion detection system work? What are the important components of an intrusion detection system? **5**
iii. How to implement the smart agriculture system using IoT? **5**

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Marking Scheme

CS3EL06[T]- Internet of Things

Q.1	i)	What is the full form of the LPWAN? (b) Low Power Wide Area Network	**1**
	ii)	What is an IoT network? (b) a collection of Interconnected devices	**1**
	iii)	One of the advantages of SDN-based sensor network is (a) Real-time programmability	**1**
	iv)	A networking architecture that separates the control plane from the data plane and centralizes the network controller is known as: (a) Software-Defined Networking	**1**
	v)	"Consider a system where, a heat sensor detects an intrusion and alerts the security company." What kind of a requirement the system is providing? (a) Functional	**1**
	vi)	Which of the following is not an application of IoT? (c)Arduino	**1**
	vii)	Integrity in data security is. (a) Detecting unauthorized data modification	**1**
	viii)	Which of the following is a disadvantage of IoT? (c) Privacy and security concerns	**1**
	ix)	What is a smart home in IoT? (a) A home that is equipped with IoT devices and systems	**1**
	x)	Which is the example for smart grid edge device for utility? (a) Smart Meters	**1**
Q.2	i.	Define sensor and actuator. Sensor definition 1 mark Actuator definition 1 mark	**2**
	ii.	Discuss the significance of REST Based Communication API Define REST 1 mark Describe the importance of REST 2 mark	**3**
	iii.	Draw and discuss the reference model of IoT Draw reference model 3 mark Describe the diagram 2 mark	**5**
OR	iv.	What are the three main types of MQTT messages? Describe. Types of MQTT messages 2 mark Describe each message type 3 mark	**5**
Q.3	i.	What is Machine to Machine communication (M2M)? Definition of M2M 2 mark	**2**
	ii.	Draw Software-Defined Networking architecture and enlist the different models of SDN. Draw labelled diagram SDN 4 mark SDN models 4 mark	**8**
OR	iii.	How does Cloud Computing and Big Data contribute to Internet of Things? Describe cloud and Big Data 3 mark Contribution with example 5 mark	**8**
Q.4	i.	Explain issues in IoT security Three to four IoT security 3 mark	**3**
	ii.	Draw and explain the purpose & requirements specification of an IoT Application. Steps involved in the designing of an IoT system 4 mark Description 3 mark	**7**
OR	iii.	Explain Information View, Deployment, Functional View, and Operational View, Other Relevant architectural views of IoT reference architecture. Explain information deployment functional and other operational view. 5 mark Any relevant architecture 2 mark	**7**
Q.5	i.	What are the common attacks on IoT and their existing countermeasures?? Describe common attacks on IoT 3 mark Counter measures 1 mark	**4**
	ii.	Discuss privacy, security, and trust in IoT-Data-Platforms in context of smart cities. Describe privacy 2 mark Describe security 2 mark	**6**

		Describe trust 2 mark	
OR	iii.	What are the features and challenges of IoT-based access control?	**6**
		Describe the features 3 mark	
		Describe challenges 3 mark	
Q.6		Attempt any two:	
	i.	Enlist challenges faced by industry related IoT Applications in detail.	**5**
		For each challenges 1*5 mark	
	ii.	How does home intrusion detection system work? What are the important components of an intrusion detection system?	**5**
		Steps/process involved in detection /block Diagram of steps (if any) 3 mark	
		Important components 2 mark	
	iii.	How to implement the smart agriculture system using IoT?	**5**
		Case description 2 mark	
		Implementation 3 mark	

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