Enrollment No.....................................

Faculty of Engineering
End Sem Examination Dec 2024
OE00069 IoT with Applications

Programme: B.Tech.   Branch/Specialisation: 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.

			Marks	BL	PO	CO	PSO
Q.1	i.	Which layer is NOT part of the typical IoT architecture?	1	1	1	1	
		(a) Device layer (b) Network layer					
		(c) Processing layer (d) Application layer					
	ii.	Which technology is essential for connecting IoT devices to the internet?	1	1	1	3	
		(a) Bluetooth (b) Wi-Fi					
		(c) SDN (d) Both (a) and (b)					
	iii.	Which of the following enables virtualization in IoT?	1	1	1	3	
		(a) SDN (b) NFV					
		(c) None of the above (d) Both (a) and (b)					
	iv.	Which of the following correctly distinguishes IoT from M2M?	1	2	2	1	
		(a) IoT is cloud-based, while M2M is typically point-to-point					
		(b) M2M has more devices than IoT					
		(c) IoT is used for data storage, while M2M is used for data analysis					
		(d) IoT and M2M have no difference					
	v.	Which of the following is NOT part of the IoT design process?	1	1	1	2	
		(a) Information model (b) Access control					
		(c) Domain model (d) Functional view					

vi. Which model represents the structure and entities involved in a specific IoT domain? **1** 2 2 2
(a) Information model (b) Domain model
(c) Functional view (d) Operational view

vii. Which of the following is NOT a method of identity management in IoT? **1** 1 2 4
(a)Data encryption algorithms
(b) Digital certificates
(c) Access Control Lists (ACLs)
(d) User authentication

viii. Which of the following is a common vulnerability in IoT systems? **1** 4 6 4
(a) Strong firewall
(b) Poor encryption
(c) Network redundancy
(d) Regular software updates

ix. Which IoT system is used to enhance security at homes? **1** 4 6 5
(a) Smart lighting
(b) Intrusion detection system
(c) Smart thermostat
(d) Smart parking

x. In agriculture, IoT is used primarily to monitor which of the following? **1** 4 6 5
(a) Intruder movement
(b) Traffic patterns
(c) Soil moisture and crop health
(d) Smart lighting in fields

Q.2 i. Define the Internet of Things (IoT). List the key characteristics of IoT. **2** 2 1 1

ii. Differentiate between IoT communication protocols such as MQTT and HTTP. How does each serve different IoT needs? **3** 4 2 3

iii. Compare and contrast different communication models in IoT. How do client-server, publish-subscribe models differ in IoT? **5** 4 2 3

OR iv. Describe the IoT architectural view. What are the main components and layers of IoT architecture? **5** 3 4 2

Q.3 i. List the differences between M2M and IoT. **2** 2 1 1

ii. Explain the concept of Software Defined Networking (SDN), Explain how it is differ from Network Function Virtualization (NFV) and its role in IoT. **8** 4 3 3

OR iii. Demonstrate how data storage works in IoT using cloud-based services. Provide examples. **8** 3 5 5

Q.4 i. Outline the steps in the IoT platform design methodology. How do influence the purpose and requirements for platform design? **2** 3 3 2

ii. Describe the various IoT levels. How does each level contribute to the overall IoT system functionality? **8** 2 4 2

OR iii. Use an example to illustrate how device and component integration is handled in IoT. **8** 6 5 5

Q.5 Attempt any two:
i. Describe the layered attacker model and its purpose in IoT security. **5** 4 6 4

ii. Discuss the various access control mechanisms used in IoT. Why is access control critical for protecting IoT data and resources? **5** 4 2 4

iii. What are some common vulnerabilities in IoT systems? How can these vulnerabilities impact IoT security? **5** 5 8 4

Q.6 Attempt any two:
i. What is a home intrusion detection system? How does IoT enhance its capabilities? **5** 3 7 5

ii. Demonstrate the use of IoT in agriculture by describing a specific IoT-enabled solution. **5** 3 7 5

iii. Compare IoT applications in home automation and smart cities. How do their requirements and challenges differ? **5** 4 9 5

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Marking Scheme

OE00069 (T) IoT with Applications (T)

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Q.1　i)　　(C) Processing Layer　　　　　　　　　　　　　　　　　　**1**
　　　ii)　　(D) Both A and B　　　　　　　　　　　　　　　　　　　**1**
　　　iii)　　(D) Both A and B　　　　　　　　　　　　　　　　　　　**1**
　　　iv)　　(A) IoT is cloud-based, while M2M is typically point-to-point.　**1**
　　　v)　　(B) Access Control　　　　　　　　　　　　　　　　　　**1**
　　　vi)　　(B) Domain Model　　　　　　　　　　　　　　　　　　**1**
　　　vii)　　(A)Data encryption algorithms　　　　　　　　　　　　　**1**
　　　viii)　　(B) Poor encryption　　　　　　　　　　　　　　　　　**1**
　　　ix)　　(B) Intrusion detection system　　　　　　　　　　　　　**1**
　　　x)　　(C) Soil moisture and crop health　　　　　　　　　　　　**1**

Q.2　i.　　Define the Internet of Things (IoT).　　　　　　　　　　　**1**
　　　　　　 List the key characteristics of IoT.　　　　　　　　　　**1**
　　　ii.　　Differentiate between IoT communication protocols such as　**2**
　　　　　　MQTT and HTTP.　　　　　　　　　　　　　　　　　　**1**
　　　　　　How does each serve different IoT needs?
　　　iii.　　Compare and contrast different communication models in IoT.　**5**
　　　　　　How do client-server 2.5M
　　　　　　publish-subscribe, models differ in IoT? 2.5M
OR　iv.　　Describe the IoT architectural view. 2.5M　　　　　　　　**5**
　　　　　　What are the main components and layers of IoT architecture?
　　　　　　2.5M

Q.3　i.　　List the differences between M2M and IoT.(minimum 3　**2**
　　　　　　difference with parameters)
　　　ii.　　Explain the concept of Software Defined Networking (SDN) 4M　**8**
　　　　　　Explain how it is differ from Network Function Virtualization
　　　　　　(NFV) and its role in IoT. 4M
OR　iii.　　Demonstrate how data storage works in IoT using cloud-based　**8**
　　　　　　services. 4M
　　　　　　 Provide examples 4M

Q.4　i.　　Outline the steps in the IoT platform design methodology.　**2**
　　　　　　(diagram) 1M
　　　　　　How do purpose and requirements influence platform
　　　　　　design?(definations) 1M

　　　ii.　　Describe the various IoT levels. 2M　　　　　　　　　　**8**
　　　　　　How does each level contribute to the overall IoT system
　　　　　　functionality? Explanation of each level with diagram. 6M
OR　iii.　　Use an example to illustrate how device and component
　　　　　　integration is handled in IoT.　　　　　　　　　　　　**8**
　　　　　　Example 2M
　　　　　　Diagram and explanation 6M

Q.5　i.　　Describe the layered attacker model and its purpose in IoT　**5**
　　　　　　security.
　　　　　　Layer attacker model 2M
　　　　　　Its solutions and purpose 3M
　　　ii.　　Discuss the various access control mechanisms used in IoT. Why
　　　　　　is access control critical for protecting IoT data and resources?　**5**
　　　　　　Access control mechanisms 2M
　　　　　　Types of protections 3M
　　　iii.　　What are some common vulnerabilities in IoT systems? How can
　　　　　　these vulnerabilities impact IoT security?　　　　　　　**5**
　　　　　　Each vulnerabilities (min 5)

Q.6　i.　　What is a home intrusion detection system, and how does IoT　**5**
　　　　　　enhance its capabilities?
　　　　　　Home intrusion detection system 2M
　　　　　　Different capabilities 3M
　　　ii.　　Demonstrate the use of IoT in agriculture by describing a specific
　　　　　　IoT-enabled solution.　　　　　　　　　　　　　　　**5**
　　　　　　Diagram 2M
　　　　　　Different solutions with explanation 3M
　　　iii.　　Compare IoT applications in home automation and smart cities.　**5**
　　　　　　2M
　　　　　　How do their requirements and challenges differ? 3M

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