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

Enrollment No.....

Faculty of Engineering

End Sem Examination May-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.

Q.1 i. Which of the following is not a typical component of an IoT system? **1**

(a) Sensors (b) Cloud computing

(c) Mobile phones (d) Drones

ii. What is one of the main challenges associated with IoT security? **1**

(a) Lack of connectivity

(b) Limited data storage

(c) Privacy and data protection

(d) High cost of devices

iii. What is the significance of M2M communication in smart cities? **1**

(a) It increases traffic congestion

(b) It reduces energy consumption

(c) It leads to more pollution

(d) It doesn't impact city infrastructure

iv. Which technology is often used to manage and orchestrate VNFs in NFV environments? **1**

(a) Artificial Intelligence (AI)

(b) Machine Learning (ML)

(c) Software-Defined Networking (SDN)

(d) Blockchain

v. What role does user feedback play in IoT design methodology? **1**

(a) It has no impact on the design process

(b) It helps refine and improve the IoT system

(c) It delays the deployment phase

(d) It is used for marketing purposes only

vi. Which activity is part of the validation phase in IoT design methodology? **1**
(a) Identifying user requirements
(b) Developing software code
(c) Creating personas
(d) Testing the IoT system with real users

vii. What role do IoT devices play in DDoS attacks? **1**
(a) They can be hijacked to launch DDoS attacks
(b) They are immune to DDoS attacks
(c) They protect against DDoS attacks
(d) They are not connected to the internet

viii. At layer 3 of the layered attacker model, attackers typically exploit vulnerabilities in: **1**
(a) Hardware components
(b) Operating systems and applications
(c) Network protocols and configurations
(d) User behaviour

ix. Which industry benefits from IoT applications in predictive maintenance? **1**
(a) Manufacturing (b) Smart payment
(c) Entertainment (d) Education

x. What types of sensors are commonly used in Home IDS? **1**
(a) Temperature sensors (b) Motion sensors
(c) Sound sensors (d) All of these

Q.2 i. Define IoT and explain its core concept. **2**

ii. What is MQTT? Discuss the role of the MQTT protocol in supporting lightweight and efficient communication in IoT. **3**

iii. Explain the difference between COAP and HTTP protocols in the context of IoT. **5**

OR iv. What are different communication models in IoT? Explain briefly. **5**

Q.3 i. Differentiate between IoT & M2M on the basis of different parameters. **3**

ii. Explain the role of cloud computing in IoT data storage. What are the advantages and considerations of using cloud storage for IoT data? **7**

OR iii. Write short notes on- **7**
(a) SDN (b) NFV

Q.4 i. Explain the concept of REST based communication API using a diagram. **3**

ii. What do you understand by IoT levels? Explain the difference between different levels on IoT. **7**

OR iii. Explain functional view specification & operational view specification considering case study of home automation. **7**

Q.5 i. Differentiate between authentication & authorisation in IOT. **3**

ii. Explain the concept of key exchange & management for secure communication in IoT. **7**

OR iii. Explain the layered attack model. Give brief description of possible solution for different types of attacks. **7**

Q.6 Attempt any two:

i. Explain the case study of home automation system using different sensors which can be deployed in IoT. **5**

ii. What is a weather monitoring system in the context of IoT? What types of weather parameters can be monitored using IoT-based weather monitoring systems? **5**

iii. What are the different tasks that can be performed by home intrusion detection system? Explain briefly. **5**

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Marking Scheme

IOT WITH APPLICATION (IoT) OE00069

Q.1 i) Which of the following is not a typical component of an IoT system? **1**

C) Mobile Phones

ii) What is one of the main challenges associated with IoT security? **1**

C) Privacy and data protection

iii) What is the significance of M2M communication in smart cities? **1**

B) It reduces energy consumption

iv) Which technology is often used to manage and orchestrate VNFs in NFV environments? **1**

C) Software-Defined Networking (SDN)

v) What role does user feedback play in IoT design methodology? **1**

B) It helps refine and improve the IoT system

vi) Which activity is part of the validation phase in IoT design methodology? **1**

D) Testing the IoT system with real users

vii) What role do IoT devices play in DDoS attacks? **1**

A) They can be hijacked to launch DDoS attacks

viii) At Layer 3 of the Layered Attacker Model, attackers typically exploit vulnerabilities in: **1**

B) Operating systems and applications

ix) Which industry benefits from IoT applications in predictive maintenance? **1**

A) Manufacturing

x) What types of sensors are commonly used in Home IDS? **1**

D) All of the above

Q.2 i. Define IoT and explain its core concept. **2**

Definition 1 Marks

Core concept 1 Marks

ii. What is MQTT .Discuss the role of the MQTT protocol in supporting lightweight and efficient communication in IoT. **3**

MQTT 1 Marks

Role of MQTT 2 Marks

iii. Explain the difference between COAP and HTTP protocols in the context of IoT. **5**

COAP 2.5 Marks

HTTP 2.5 Marks

OR iv. What are different Communication Models in IoT? Explain briefly. **5**

Each models 1 marks

Q.3 i. Differentiate between IoT & M2M on the basis of different Parameters? **3**

IoT 1.5 Marks

M2M 1.5 Marks

ii. Explain the role of cloud computing in IoT data storage. What are the advantages and considerations of using cloud storage for IoT data? **7**

role of cloud computing in IoT data storage 3 Marks

advantages 2 Marks

considerations 2 Marks

OR iii. Write Short notes on (a) SDN 3.5 Marks (b)NFV 3.5 Marks **7**

Q.4 i. Explain the Concept of REST based Communication API using a diagram? **3**

Concept of REST based Communication API 2 Marks

Diagram 1 Marks

ii. What do you understand by IoT levels? Explain the difference between different levels on IoT? **7**

Explanation & diagram 2 Marks

Different levels 5 Marks

OR iii. Explain Functional view Specification & Operational view Specification considering case study of home automation? **7**

Functional view Specification 3.5 Marks

Operational view Specification 3.5 Marks

Q.5 i. Differentiate between Authentication & Authorisation in IOT **3**

Each difference 1 marks

ii. Explain the concept of Key exchange & Management for secure communication in IoT? **7**

Concept & steps 3 Marks

Diagram 4 Marks

OR iii. Explain the layered Attack Model? Give brief description of possible solution for different types of attacks? **7**

layered Attack Model 3 Marks

possible solutions 4 Marks

Q.6 Attempt Any two

i. Explain the case study of Home Automation system using different sensors which can be Deployed in IoT? **5**

Diagram 1 Marks

Sensors explanations 4 Marks

ii. What is a weather monitoring system in the context of IoT? What types of weather parameters can be monitored using IoT-based weather monitoring systems? **5**

weather monitoring system 1 Marks

weather parameters can be monitored 4 Marks

iii. What are the different tasks that can be performed by Home Intrusion Detection system? Explain briefly. **5**

Each task 1 marks.

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