

Enrollment No.....



Faculty of Engineering
End Sem Examination Dec-2023
CS3EL14 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. Which of the following standards is known as low data-rate WPAN (Wireless Personnel Area Network)? **1**
 (a) IEEE 802.15.2 (b) IEEE 802.15.4
 (c) IEEE 802.15e (d) IEEE 802.15c
- ii. Which of the following is closely related to IoT? **1**
 (a) Machine-to-Machine (M2M) communications
 (b) Cyber-Physical-Systems (CPS)
 (c) Web-of-Things (WoT)
 (d) All of these
- iii. What are the three layers of SDN (Software Defined Network)? **1**
 (a) Data plane, control plane, and application plane
 (b) Infrastructure, platform, and software
 (c) Core, distribution, and access
 (d) None of these
- iv. Which of the following is not the benefits of NFV (Network Function Virtualization)? **1**
 (a) Increased agility and flexibility
 (b) Reduced operational costs
 (c) Improved scalability and performance
 (d) Availability of standard approaches and protocols
- v. Which of the following is the highest IoT level? **1**
 (a) Device level (b) Edge level
 (c) Cloud level (d) Fog level

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vi.	Which of the following steps is involved in the design and implementation of an IoT platform?	1
	(a) Requirements gathering (b) System design (c) Implementation (d) All of these	
vii.	Which of the following is not a security library?	1
	(a) wolfSSL (b) cryptosuite (c) Ionic (d) OpenSSL	
viii.	OWASP has identified top ten vulnerabilities in IoT applications/services as	1
	I. secure web interface, II. insufficient authentication or authorization, III. secure network services IV. lack of transport encryption/integrity verification, V. privacy concerns VI. insecure cloud interface VII. insecure mobile interface VIII. insufficient security configurability IX. insecure software or firmware X. poor physical security.	
	(a) All except I (b) All except I and III (c) All except II and IV (d) II to IX	
ix.	What is the main benefit of using IoT-based smart parking systems?	1
	(a) To make it easier for drivers to find parking spots (b) To reduce traffic congestion (c) To increase revenue for parking operators (d) All of these	
x.	Which of the following in not a ZigBee device?	1
	(a) Coordinators (b) Start Devices (c) Routers (d) End devices	
Q.2	i. Define Internet of Things.	2
	ii. Enlist IoT enabling technologies.	3
	iii. Explain various IoT deployment levels with suitable examples.	5
OR	iv. What do you understand by MQTT (Message Queuing Telemetry Transport)? What is the purpose of MQTT?	5
Q.3	i. Define Fog Computing.	2

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	ii.	Explain M2M (Machine-to-Machine). Differentiate between IOT and M2M.	8
OR	iii.	Illustrate SDN Architecture. What is the role of Centralized Network Controller?	8
Q.4	i.	Explain various entities in domain model.	3
	ii.	Discuss various steps in IoT system design.	7
OR	iii.	Depict Information model and deployment design for home intrusion detection with explanation?	7
Q.5	i.	Enumerate features of S-HTTP (Secure HTTP)?	4
	ii.	Answer in brief: (a) Enlist Layer 2 attack solutions. (b) When do we use DTLS and when X.509? (c) Define security tomography.	6
OR	iii.	How do you define security requirements and threat analysis? Write the usage of five components in the security group of functions.	6
Q.6		Attempt any two:	
	i.	What are the different types of sensors that can be used in IoT-based home automation systems?	5
	ii.	Design an IoT-based weather monitoring system that can collect data on temperature, humidity, wind speed, and other weather conditions. Provide a block diagram and structure of code.	5
	iii.	Discuss the benefits and challenges of using IoT to create smart cities.	5

Marking Scheme
Internet of Things (T) - CS3EL14 (T)

Q.1	i)	b. IEEE 802.15.4	1
	ii)	d. All of these	1
	iii)	a. Data plane, control plane, and application plane.	1
	iv)	d. Availability of standard approaches and protocols.	1
	v)	c. Cloud level.	1
	vi)	d. All of above.	1
	vii)	c. Ionic	1
	viii)	b. All except (i) and (iii)	1
	ix)	a. To make it easier for drivers to find parking spots	1
	x)	b. Start Devices	1
Q.2	i.	Internet of Things (As per explanation).	2
	ii.	Enlist IoT enabling technologies. (0.5 mark *6)	3
	iii.	Explain various IoT deployment levels. 3 Marks	5
		Example 2 Marks	
OR	iv.	MQTT 3 Marks	5
		purpose of MQTT 2 Marks	
Q.3	i.	Definition Fog Computing. (As per explanation)	2
	ii.	M2M(Machine-to-Machine) 4 Marks	8
		Differentiate between IOT and M2M. 4 Marks	
OR	iii.	Illustration SDN Architecture 4 Marks	8
		Role of Controller 4 Marks	

Q.4	i.	Entity in domain model	1 Mark*3	3
	ii.	Steps in IoT system design.	1 Mark*7	7
OR	iii.	Informationdetection	2 Marks	7
		Deployment intrusion detection	2 Marks	
		Explanation	3 Marks	
Q.5	i.	Enumerate (Secure HTTP)	1 Mark*4	4
	ii.	Enlist Layer 2 attack solutions.	(0.5 Mark*4)	6
		When do we use DTLS and when X.509	2 Marks	
OR	iii.	Define security tomography.	2 Marks	
		Security requirements (1.5 marks)		6
		Threat analysis (1.5 marks)		
Q.6		Usage of five functions components in the security group of functions. (3 marks)		
	i.	IoT-based home sensor type)	(1 Mark*5)	5
	ii.	Block diagram	3 Marks	5
		Structure of code	2 Marks	
	iii.	Benefits of using IoT to create smart cities	3 Marks	5
		Challenges	2 Marks	
