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

Enrollment No.....

Faculty of Engineering

End Sem (Even) Examination May-2019

CS3EL06 / IT3EL06 Internet of Things

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

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.

Q.1 i. Brokers in MQTT **1**

(a) Connects Publishers and subscribers

(b) Classify the sensor data into topics

(c) Both (a) and (b)

(d) None of these

ii. CoAP stands for **1**

(a) Contention Application Protocol

(b) Constrained Application Protocol

(c) Cluster Application Protocol

(d) Continuous Application Protocol

iii. Machine-to-Machine (M2M) is designed for **1**

(a) Isolated systems using proprietary solutions

(b) Cross platform integration

(c) Home automation only

(d) None of these

iv. The basic SDN concept involves: **1**

(a) Separate control logic from hardware switches

(b) Define the control logic in a centralized manner

(c) Control the entire network including individual switches

(d) All of these

v. Entity is a discrete and identifiable entity in the physical environment. **1**

(a) Virtual Entity (b) Physical Entity

(c) Both (a) and (b) (d) None of these

P.T.O.

vi. Correct sequence for IoT design methodology is **1**
(a) Purpose & Requirement, Process Model Specification, Information Model Specification, Domain Model Specification
(b) Purpose & Requirement, Process Model Specification, Domain Model Specification, Information Model Specification
(c) Purpose & Requirement, Domain Model Specification, Information Model Specification, Process Model Specification
(d) None of these

vii. _____ is a weakness that can be exploited by attackers. **1**
(a) System with Virus
(b) System without firewall
(c) System with vulnerabilities
(d) System with strong password

viii. Network Tomography refers to: **1**
(a) Study of vulnerabilities
(b) Study of security aspects for network monitoring
(c) Both (a) and (b)
(d) None of these

ix. ITS stands for _____ **1**
(a) Internet Travel Services
(b) Internet Transportation Security
(c) Intelligent Transportation Security
(d) Intelligent Transportation Services

x. Home automation using IoT requires **1**
(a) Sensors (b) Actuators
(c) Both (a) and (b) (d) None of these

Q.2 i. Discuss the characteristics of IoT. **2**
ii. What is the role of things and Internet in IoT? **3**
iii. Why do IoT systems have to be self-adapting and self-configuring? **5**

OR iv. What is WebSocket-based communication API? Discuss at IoT service which uses WebSocket-based communication API. **5**

Q.3 i. Differentiate between Machines in M2M and Things in IoT. **2**
ii. What is Software Defined Network? Discuss its architecture. Describe how SDN can be used for different levels of IoT? **8**
OR iii. What is Network Function Virtualization? Discuss its architecture. Describe how NFV can be used for virtualizing IoT devices? **8**

Q.4 i. What are the steps involved in IoT design methodology? **3**
ii. Discuss domain model specification and information model specification with suitable example. **7**
OR iii. What is functional view specification and operational view specification? Justify your answer with suitable example. **7**

Q.5 i. Why security is important to IoT applications? What are security requirements in IoT? **4**
ii. Discuss Layered attacker model and their solution. **6**
OR iii. What is vulnerability? Discuss vulnerabilities in IoT applications/services. **6**

Q.6 Attempt any two:
i. Discuss the importance of IoT in agriculture. **5**
ii. How IoT is useful for Home automation? **5**
iii. How a smart city can be built using IoT? **5**

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Marking Scheme

CS3EL06 / IT3EL06 Internet of Things

Q.1	i.	Brokers in MQTT (c) Both (a) and (b)		**1**
	ii.	CoAP stands for (b) Constrained Application Protocol		**1**
	iii.	Machine-to-Machine (M2M) is designed for (b) Cross platform integration		**1**
	iv.	The basic SDN concept involves: (d) All of these		**1**
	v.	Entity is a discrete and identifiable entity in the physical environment. (b) Physical Entity		**1**
	vi.	Correct sequence for IoT design methodology is (b) Purpose & Requirement, Process Model Specification, Domain Model Specification, Information Model Specification		**1**
	vii.	_____ is a weakness that can be exploited by attackers. (c) System with vulnerabilities		**1**
	viii.	Network Tomography refers to: (c) Both (a) and (b)		**1**
	ix.	ITS stands for _____ (d) Intelligent Transportation Services		**1**
	x.	Home automation using IoT requires (c) Both (a) and (b)		**1**
Q.2	i.	Characteristics of IoT. 0.5 mark for each point	(0.5 mark * 4)	**2**
	ii.	Role of things Role of Internet in IoT	1.5 marks 1.5 marks	**3**
	iii.	IoT systems have to be Self-adapting Self-configuring	 2.5 marks 2.5 marks	**5**
OR	iv.	WebSocket-based communication API Diagram Description IoT service	 1 mark 1.5 marks 2.5 marks	**5**

Q.3	i.	Differentiate between Machines in M2M and Things in IoT. For machine For things	 1 mark 1 mark	**2**
	ii.	Definition Software Defined Network Its architecture Uses for different levels of IoT	1 mark 3 marks 4 marks	**8**
OR	iii.	Definition Network Function Virtualization Its architecture For virtualizing IoT devices	1 mark 3 marks 4 marks	**8**
Q.4	i.	Steps involved in IoT design methodology		**3**
	ii.	Definition domain model specification Description with example Definition information model specification Description with example	1 mark 2.5 marks 1 mark 2.5 marks	**7**
OR	iii.	Functional view specification Example Operational view specification Example	2 marks 1.5 marks 2 marks 1.5 marks	**7**
Q.5	i.	Security is important to IoT applications Security requirements in IoT	2 marks 2 marks	**4**
	ii.	Layered attacker model Their solution	3 marks 3 marks	**6**
OR	iii.	Vulnerability definition Vulnerabilities in IoT applications/services	1 mark 5 marks	**6**
Q.6		Attempt any two:		
	i.	Importance of IoT in agriculture. IoT applications Uses of IoT in agriculture	 1 mark 4 marks	**5**
	ii.	IoT is useful for Home automation IoT applications Built home automation using IoT	 1 mark 4 marks	**5**
	iii.	Smart city can be built using IoT IoT applications Uses of IoT in smart city	 1 mark 4 marks	**5**

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