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

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

CS3EO03 Edge Computing

Programme: B.Tech. Branch/Specialisation: CSE

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. Edge computing is- **1**

(a) An architecture that processes data as close to its source as possible

(b) A new name for computing

(c) A type of computing that leaves network teams on edge

(d) Computing in cloud server

ii. Why should anyone care about edge computing? **1**

(a) It can alleviate latency issues

(b) It can ease network congestion

(c) It can bolster bandwidth for IoT devices

(d) All of these

iii. Which of the following is a protocol related to IoT Cloud? **1**

(a) NFC (b) CoAP

(c) ZigBee (d) All of these

iv. What connects IoT devices to the cloud in order to aggregate data, translate between protocols and process data before sending it on? **1**

(a) IoT gateways (b) IoT sensors

(c) IoT standards (d) IoT processors

v. What bit processor is used in Pi 3? **1**

(a) 64-bit (b) 32-bit

(c) 128-bit (d) Both 64 and 32 bit

vi. How many USB ports are present in Raspberry Pi 3? **1**

(a) 5 (b) 2 (c) 4 (d) 3

P.T.O.

vii. Which port is used to power the raspberry pi device? **1**
(a) Ethernet port (b) HDMI port
(c) Micro USB power port (d) None of these

viii. MQTT is- **1**
(a) Based on push pull architecture
(b) Based on client-server architecture
(c) Based on publish-subscribe architecture
(d) None of these

ix. How will the edge change organizations' relationship with the cloud? **1**
(a) The edge will send more data directly to the cloud
(b) Organizations will use the cloud the same way and just add edge computing
(c) Edge computing doesn't encourage organizations to stop storing sensitive data in the cloud
(d) The edge will reduce the amount of data sent to the cloud, potentially saving organizations money

x. Which protocol is lightweight? **1**
(a) SPI
(b) CoAP
(c) HTTP
(d) MQTT

Q.2 i. What is edge computing? Explain its purpose. **2**
ii. What are the major edge computing use cases? **3**
iii. Explain edge computing hardware architectures. **5**
OR iv. Explain following communication models: **5**
(a) Edge
(b) Fog

Q.3 i. Differentiate edge and fog computing. **2**
ii. What is a connected ecosystem? Compare IoT versus machine-to-machine versus SCADA. **8**
OR iii. Explain IoT and edge architecture. Also explain the role of an architect. **8**

Q.4 i. What is Raspberry Pi? How does it work? **3**
ii. What are the different components of a Raspberry Pi board? Also explain the configuration of Raspberry Pi. **7**
OR iii. How are DHT sensors interfaced to raspberry? Explain images and videos processing in Raspberry Pi. 7

Q.5 i. What is MQTT? How does MQTT communication protocol work? **4**
ii. Explain packet structure of MQTT. **6**
OR iii. Explain MQTT 3.1.1 working with an example. **6**

Q.6 Attempt any two:
i. How does edge computing work with Raspberry Pi? Give some application areas. **5**
ii. Explain working of edge computing in industrial and commercial IoT with an example. **5**
iii. What is an example of a solution that requires the use of edge computing and the internet of things? **5**

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Marking scheme
CS3EO03 Edge Computing

Q.1	i)	Edge computing is: a. An architecture that processes data as close to its source as possible	**1**
	ii)	Why should anyone care about edge computing? d. All of the Above	**1**
	iii)	Which of the following is a protocol related to IoT Cloud? b. CoAP	**1**
	iv)	What connects IoT devices to the cloud in order to aggregate data, translate between protocols and process data before sending it on? a. IoT gateways	**1**
	v)	What bit processor is used in Pi 3? a. 64-bit	**1**
	vi)	How many USB ports are present in Raspberry Pi 3? c. 4	**1**
	vii)	Which port is used to power the raspberry pi device? c. Micro USB power port	**1**
	viii)	MQTT is: c. Based on publish-subscribe architecture	**1**
	ix)	How will the edge change organizations' relationship with the cloud? d. The edge will reduce the amount of data sent to the cloud, potentially saving organizations money	**1**
	x)	Which protocol is lightweight? d. MQTT	**1**
Q.2	i.	What is Edge Computing? Explain its purpose. Definition 1 mark Purpose 1 mark	**2**
	ii.	What are the major Edge Computing use cases? Use cases 3 marks	**3**
	iii.	Explain Edge computing hardware architectures. Architecture 5 marks	**5**
OR	iv.	Explain following Communication Models - (any two) a. Edge b. Fog c. M2M Each model 2.5 marks	**5**
Q.3	i.	Differentiate Edge and fog computing. At least 4 differences 2 marks	**2**
	ii.	What is a connected Ecosystem? Compare IoT versus machine-to-machine versus SCADA. Connected ecosystem 3 marks Comparisons 5 marks	**8**
OR	iii.	Explain IOT and Edge architecture. Also explain the role of an Architect. Architecture 6 marks Role of architect 2 marks	**8**
Q.4	i.	What is Raspberry Pi? How does it work? Definition 1.5 marks Working 1.5 marks	**3**
	ii.	What are the different components of a Raspberry pi board? Also explain the configuration of Raspberry pi. Components 4 marks Configuration 3 marks	**7**
OR	iii.	How are DHT sensors interfaced to Raspberry? Explain images and videos processing in Raspberry Pi. DHT sensors 4 marks Images and videos processing 3 marks	7

Q.5	i.	What is MQTT? How does MQTT communication protocol work?	**4**
		Definition 2 marks	
		Working 2 marks	
	ii	Explain packet structure of MQTT.	**6**
		Packet Structure 6 marks	
OR	ii.	Explain MQTT 3.1.1 working with an example.	**6**
		Working 4 marks	
		Example 2 marks	
Q.6		Attempt any two:	
	i.	How does Edge Computing work with Raspberry Pi? Give some application areas.	**5**
		Working 3 marks	
		Application 2 marks	
	ii.	Explain working of Edge Computing in industrial and commercial IoT with an example.	**5**
		Working 3 marks	
		Example 2 marks	
	iii.	What is an example of a solution that requires the use of edge computing and the Internet of things?	**5**
		Example 5 marks	

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