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B.Tech DEGREE EXAMINATION, DECEMBER 2023

Fifth & Sixth Semester

18CSE322T - IOT ARCHITECTURE AND PROTOCOLS WITH AWS SERVICES

(For the candidates admitted during the academic year 2020 - 2021 & 2021 - 2022)

Note:

i. **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

ii. **Part - B** and **Part - C** should be answered in answer booklet.

Time: 3 Hours **Max. Marks: 100**

PART - A (20 × 1 = 20 Marks)

Answer **all** Questions

		Marks	BL	CO
1.	What is the difference between M2M and IoT? (A) M2M is a form of communication between two machines, while IoT is a network of connected devices that can exchange data. (B) M2M is a network of connected devices that can exchange data, while IoT is a form of communication between two machines (C) M2M is the transfer of data between two or more machines, while IoT is the transfer of data between two or more people (D) M2M is the transfer of data between two or more people, while IoT is the transfer of data between two or more machines	1	1	1
2.	What is the most important factor to be considered when building an IoT architecture? (A) Cost (B) Usability (C) Security (D) Scalability	1	1	1
3.	Select the data storage model most suitable for IoT devices. (A) Relational databases (B) NoSQL databases (C) In-memory databases (D) Object-oriented databases	1	1	2
4.	What is the main purpose of an IoT system? (A) Collecting data (B) Automating processes (C) Connecting devices (D) Controlling operations	1	1	2
5.	Which of the following is NOT an IEEE 802.11 protocol? (A) Wi-Fi (B) Bluetooth (C) WiMAX (D) ZigBee	1	1	3
6.	What is the purpose of data acquisition? (A) To collect data from various sources (B) To validate data accuracy (C) To store data in a secure environment (D) To process data for analysis	1	1	3
7.	What is XaaS? (A) Everything as a Service (B) eXtensible as a Service (C) Exchange as a Service (D) eXpand as a Service	1	1	3

8.	What is the primary purpose of 3GPP MTC? (A) To define a new physical layer protocol for mobile communication (B) To provide a reliable and secure data link layer protocol for mobile communication (C) To define a new medium access control (MAC) protocol for mobile communication (D) To provide a user interface for managing cellular networks	1	1	3
9.	What type of technology does RFID use? (A) Radio waves (B) Infrared (C) Ultrasound (D) Laser	1	1	4
10.	What is the range of NFC (A) 5 cm (B) 10 cm (C) 20 cm (D) 30 cm	1	1	4
11.	What type of networks does Narrowband IoT use? (A) Cellular networks (B) Satellite networks (C) LPWAN networks (D) Wifi networks	1	1	4
12.	What is the main purpose of 6LoWPAN? (A) To provide a secure connection between two devices (B) To enable low-power devices to communicate with each other (C) To provide high-speed internet access (D) To provide secure access to the internet	1	1	4
13.	Identify the layer in the TCP/IP model which is responsible for establishing, maintaining and terminating virtual circuits. (A) Application Layer (B) Transport Layer (C) Internet Layer (D) Network Access Layer	1	1	5
14.	What is the main purpose of the Internet Protocol (IP)? (A) To provide a secure connection between two or more computers (B) To facilitate communication between two or more computers (C) To provide a reliable way to transfer data between two or more computers (D) To provide a way to access the World Wide Web	1	1	5
15.	What is the main difference between TCP and UDP? (A) TCP is connectionless, while UDP is connection-oriented (B) TCP is reliable, while UDP is unreliable (C) TCP is secure, while UDP is unsecured (D) TCP is connection-oriented, while UDP is connectionless	1	1	5
16.	Which of the following is not a feature of DCCP? (A) Congestion Control (B) Flow Control (C) Reliable data transfer (D) Low latency data transfer	1	1	5
17.	Which of the following service is required to connect to the AWS IoT Core service endpoint? (A) Amazon SNS (B) Amazon SQS (C) Amazon MQ (D) Amazon Kinesis	1	1	6

18.	What is the AWS IoT Platform? (A) AWS IoT is a managed cloud platform that lets connected devices easily and securely interact with cloud applications and other devices. (B) AWS IoT is a mobile application development platform. (C) AWS IoT is a machine learning platform (D) AWS IoT is an operating system for connected devices	1	1	6
19.	Which of the following protocols does AWS IoT Core NOT support? (A) XMPP (B) MQTT (C) FTP (D) CoAP	1	1	6
20.	What are the three main components of the AWS IoT Device SDK? (A) IoT Core, IoT Agent, and SDK Library (B) IoT Agent, SDK Library, and Device Shadow (C) Device Shadow, SDK Library, and IoT Core (D) SDK Library, IoT Core, and Embedded C	1	1	6

PART - B (5 × 4 = 20 Marks)

Answer **any 5** Questions

		Marks	BL	CO
21.	What are the main design principles and capabilities needed to build an architecture for IoT?	4	2	1
22.	What are the main features of IEEE 802.15.4 networks?	4	2	3
23.	What are the differences between RPL, CORPL, and CARP in terms of their ability to support IoT applications?	4	2	4
24.	How does TLS-DTLS support secure communication between two parties?	4	2	5
25.	Describe the different ways to connect devices to AWS IoT Core.	4	2	6
26.	What does the IoT Domain model encompass in the IoT Reference model?	4	2	2
27.	How can an organization ensure the security of data stored in the cloud when using XaaS?	4	2	3

PART - C (5 × 12 = 60 Marks)

Answer **all** Questions

		Marks	BL	CO
28.	(a) How do the information, functional, and communication models, as well as the safety, privacy, trust, and security models are contribute to the overall IoT architecture? **(OR)** (b) What are the key protocols used in physical, data link, network, transport, and application layers, and how do they interact with the IoT architecture?	12	2	1
29.	(a) Evaluate the effectiveness of different data acquisition techniques and the validity of the data being acquired. **(OR)** (b) Analyze the differences between the IEEE 802.11 and IEEE 802.15 wireless protocol standards	12	4	3
30.	(a) Explain the 6LoWPAN adaptation layer in detail including header compression, fragmentation, and addressing mechanisms. **(OR)** (b) Discuss the benefits of using IPv6 for IoT devices compared to IPv4. Explain the operation of Neighbor Discovery Protocol in IPv6.	12	2	4

31.	(a) Compare CoAP and MQTT protocols and explain their communication models, use cases, and message reliability.	12	2	5
	(OR)			
	(b) Discuss the need for security in IoT protocols and explain how TLS and DTLS provide security at the transport layer.			
32.	(a) Elaborate the steps involved in connecting a device to AWS IoT Core using certificates.	12	2	6
	(OR)			
	(b) What are the benefits of using thing types in AWS IoT? Explain the steps to register a thing type and associate devices.			

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