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Code No. : 16231

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (C.S.E.) VI-Semester Main &amp; Backlog Examinations, June-2022

Internet of Things

Time: 3 hours

Max. Marks: 60

Note: Answer all questions from Part-A and any FIVE from Part-B

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Draw the reference architecture of IoT.	2	1	1	1,2
2.	What are the functions of a gateway?	2	1	1	1,2
3.	Give two examples of actuators.	2	1	2	1,2
4.	Write a program to display "IoT" on serial monitor using Arduino uno.	2	3	2	1,2
5.	What is the significance of Bluetooth beacon?	2	1	3	1,2,3
6.	How many devices can be connected over Zigbee network?	2	1	3	1,2,5
7.	What is Cognitive cloud?	2	1	4	1,2,3
8.	Distinguish between AMQP and MQTT.	2	2	4	1,2,3
9.	What are the characteristics of Industry 4.0?	2	1	5	1,2,3
10.	List any four IIoT applications.	2	1	5	1,2,3,5
<b>Part-B (5 × 8 = 40 Marks)</b>					
11. a)	Differentiate between M2M and IoT.	4	2	1	1,2
b)	Explain with diagram a scenario that is appropriate for IoT deployment level-5.	4	3	1	1,2,3
12. a)	How is push button different from a switch? Write a program to turn the four LED's ON or OFF using two available switches on Arduino Uno. LED's must be controlled based on the positions of the switches.	4	3	2	1,2,3,4,5
b)	Draw 5G architecture and explain how 5G is different from other cellular technologies?	4	2	2	1,2
13. a)	Explain an application scenario where Zigbee is suitable over Bluetooth, LoRa and NFC.	4	3	3	1,2,3
b)	How is 6LowPAN different from IPV6? Explain Bluetooth protocol architecture.	4	2	3	1,2,4

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14. a)	Write an application program to perform the following functions using MQTT protocol. i) to read data from temperature sensor and publish the data to a topic RoomTemperature. ii) Subscribe to the topic to monitor the temperature. If the temperature exceeds 35 degrees, then turn on the AC connected to the relay with pin number 12.	4	3	4	1,2,3,4
b)	Explain in detail Constrained Application protocol (CoAP).	4	2	4	1,2,5
15. a)	Design a IoT architecture for a logistics management system. Assume a food processing enterprise with a fleet of 100 vehicles that carry raw material or finished goods to different locations. The system should monitor the type of material being transported by vehicle, date, out time, in time and track the path of the vehicle and temperature. A set temperature to be maintained inside the chamber of the vehicle to ensure the safety of the product. A notification to be sent if there is any change in the temperature, route change by the vehicle and alcohol detection in the driver cabin. Apply appropriate communication technology, protocol stack and physical devices needed to design the solution, with a neat diagram.	4	3	5	1,2,3,4,5
b)	Explain the current focus areas that need to be considered in the design of a smart city architecture.	4	3	5	1,2,3
16. a)	Explain the protocol architecture of IoT.	4	2	1	1,2,3,4
b)	Write a Raspberry Pi program to detect the movement of a person, turn the LED on connected to pin 9, run the servo motor connected to pin 12.	4	3	2	1,2,3
17.	Answer any <i>two</i> of the following:				
a)	Explain why an enterprise use LoRa protocol instead of cellular network for communication. Give a scenario where LoRa communication is inappropriate.	4	3	3	1,2,3
b)	Explain the steps involved to connect a device to Amazon IoT cloud. List any five services supported by Amazon cloud.	4	3	4	1,2,3
c)	What is PLC? Draw and explain the reference architecture of IIoT.	4	2	5	1,2,5

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

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