Roll No. 1580

Total No. of Page: 2

B. Tech. VIth Sem
END-SEMESTER EXAMINATION, May 2023

Course Code: Internet of Things
Course Title: COCSC20

Max. Marks: 50

Time: 3 Hours

Note: - **Attempt all five questions. Missing data / information if any, may be suitably assumed & mentioned in the answer. Write as precise as possible, do not write unnecessarily.**

Q. No.	Question	Marks	CO
Q1	**Attempt any 2 parts of the following.**		
1a	Consumer is providing the following different Analog values for encoding it into **Digital values.** Provide the solution using SAM approach. The signal for 7 bits registers with a full-scale range of 500 Volts. a) 345.5 V b) 74 V	5	2
1b	Define an embedded **system** and components in IoT device and provide the **functions** used to write analog and digital data to an actuator in Arduino IDE.	2+3	1
1c	Explain various wireless communications **boards** available in Raspberry Pi. Construct the **Design** of Smart home with Raspberry Pi and other hardware devices with neat sketch.	2+3	1
Q2	**Attempt any 2 parts of the following.**		
2a	Delhi NCR AQI is increasing day by day from Average to Severe; Prof Kumar from NSUT want to update user every minute about change in AQI to their subscribers. And you know Delhi-NCR population is around 10 million. Prof Kumar is looking for help to clear his **doubts** regarding implementation of MQTT protocol with the following points: a) Who will be subscriber, who will be publisher and where the broker will be placed? b) Which QoS **reliability** will work fine with this case, explain? c) Is there any better solution then MQTT protocol for this use-case scenario, explain. d) What could be the formatting or **allocation** of Topic, so that subscriber can easily choose the nearest publisher.	5	2, 5
2b	Define a diagrammatical **network scenario** of Xbee enabled IoT devices that are forming the **mesh topology** for transmitting data from one sender to two receivers. This scenario should fulfill the properties of mesh topology.	5	2
2c	Write **five major comparisons** in MQTT, HTTP and CoAP web protocols. (Hint: Architecture, Size, QoS, Transport Protocol, port, methods).	5	2,
Q3	**Attempt any 2 parts of the following.**		

3a	How many **types of messages** exist in CoAP protocol, **explain** each with diagrammatical representation? Also, **explain** the separate response strategy for data request.	1+2+2	3
3b	Explain the following abbreviations: a) ESC. b) 6LoWPAN. c) CoAP d) LWT e) PAN ID in ZIGBEE	5	2, 3, 4
3c	Explain the **requirement/properties** for selecting an architecture and protocol for IoT Networks.	5	3, 4
Q4	**Attempt any 2 parts of the following.**		
4a	Discuss the **challenges** in IoT network which can be addresses using SDN and how?	5	4
4b	Define the **working** of chirp spectrum and LoRa Edge in LoRa. **Differentiate** the LoRa capabilities over Wi-Fi.	3+2	4, 5
4c	What are the security **issues** and possible **attacks** over IoT networks, explain in the bullet points?	5	5
Q5	**Attempt any 2 parts of the following.**		
5a	How **blockchain** helps to make reliable IoT networks, explain with one case study.	5	4, 5
5b	Define two **types** of drones. Define the various **components** used in building of a drone for IoT applications.	2+3	4
5c	Define cloud computing? Explain the various **services** provided by the cloud over IoT. Also, mention four **cloud provider** names.	2+2+1	4