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**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MID TERM EXAMINATION - MAY 2023**

Semester : Semester VI - B.Tech ECE - 2020

Course Code : ECE3075

Course Name : Sem VI - ECE3075 - IoT Architecture and Protocols

Program : B.Tech. Electronics and Communication Engineering

Date : 18-MAY-2023

Time : 2.00 PM - 3.30 PM

Max Marks : 60

Weightage : 30%

Instructions:

- (i) Read all questions carefully and answer accordingly.
 - (ii) Question paper consists of 3 parts.
 - (iii) Scientific and non-programmable calculator are permitted.
 - (iv) Do not write any information on the question paper other than Roll Number.
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PART A

ANSWER ALL THE QUESTIONS

(5 X 2 = 10M)

1. System on Chip(SoC), is a single integrated chip (IC) that include components normally found in a standard computer system. List the components of the SOC.
(CO2) [Knowledge]
2. Sensors are characterized by their ability to sense a certain phenomenon based on the fundamental properties. Identify the characteristics of sensors.
(CO1) [Knowledge]
3. The architecture of Internet of Things(IoT) depends upon its functionality and implementation in different sectors. Still, there is a basic process flow based on which IoT is built. List the names of the basic fundamental layers of an IoT architecture.
(CO1) [Knowledge]
4. Things are connected to each other through local networks and generated enormous data which is sent to cloud. Identify the Internet of Things(IoT) device that serve as a wireless access portal to give IoT devices access to the Internet.
(CO1) [Knowledge]
5. An Internet of Things(IoT) system comprises of a number of blocks that provide the system the capabilities for identification, sensing, actuation, communication and management. List and define all the components of the functional blocks.
(CO1) [Knowledge]

PART B**ANSWER ALL THE QUESTIONS****(3 X 10 = 30M)**

6. Internet of Things is a trend that is driving the ongoing digitization and datafication of society in many new and amazing ways. Self-driving cars, autonomous manufacturing robots, and remote medical devices that let doctors diagnose patients and even carry out surgery are all possible due to these networks of connected things. Discuss the technological trends that has shaped the IoT.

(CO2) [Comprehension]

7. The machine-to-machine (M2M) paradigm implies a system of communication between two or more machines/devices without human intervention. Explain the features that are directly identifiable with M2M. Tabulate the differences between M2M and IoT architectures.

(CO1) [Comprehension]

8. To access, store and distribute the data through the Internet of Things network we need communication models. The data may be transferred between clients and servers as well as between brokers and subscribers in the IoT network. Classify the communication models available in any IoT system. Discuss in detail the communication protocol which transfers data between brokers and subscribers in an IoT system. Distinguish client-server and publish-subscribe communication models.

(CO1) [Comprehension]

PART C**ANSWER ALL THE QUESTIONS****(2 X 10 = 20M)**

9. Parking is a universal challenge for cities around the globe. According to urban planning researchers, up to 30% of cars driving in congested downtown traffic are searching for parking spaces. Ineffective parking access and administration make parking in urban areas a constant struggle and affect cities in many ways. Instead of resorting to utilizing valuable city real estate to create more parking spaces, cities often have the option of optimizing the usage efficiency of existing parking assets to better manage citizen needs. This option often provides the quickest relief to the parking issue, while minimizing the need for new investment and limiting the impact on urban architecture. Design a Smart Parking system using any standard IoT architecture to find the solution to

a) Locate a parking spot in a high-density traffic environment.

(CO1) [Application]

10. Traffic is one the most understood pain points for any city. It is the leading cause of accidental death globally, causes immense frustration, and heavily contributes to pollution around the globe. A smart city traffic solution would combine crowd counts, transit information, vehicle counts, and so on and send events regarding incidents on the road so that other controllers on the street could take action. Sketch a Smart Traffic Control system using a standard IoT World Forum Architecture for

1. License plate identification

2. To regulate the standard traffic flow speed in a stop-and-go traffic.

(CO2) [Application]