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**PRESIDENCY UNIVERSITY
BENGALURU**

SET A

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2024**

Semester : Semester V - 2021

Course Code : ECE3075

Course Name : IoT Architecture and Protocols

Program : B.Tech.

Date : 04-JAN-2024

Time : 9:30AM - 12:30 PM

Max Marks : 100

Weightage : 50%

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.

PART A

ANSWER ALL THE QUESTIONS

5 X 4M = 20M

1. A fire detection system that senses temperature and actuates sprinkler to put out flame is to be designed. Describe the sensor to actuator flow for the system.
(CO1) [Knowledge]
2. The measured value of a temperature sensor is 79.658 °C for a heater temperature of 80 °C. Compute the absolute error and percentage error.
(CO1) [Knowledge]
3. Fog computing is essential and useful for time-sensitive applications. A fog computing platform resides between cloud and physical IoT devices; it provides processing, storage, and networking services. List any four applications of fog computing.
(CO2) [Knowledge]
4. The Advanced Microcontroller Bus Architecture (AMBA) is widely used in SoC to connect processors, memory and peripherals. List the Bus architecture for high performance and peripherals.
(CO2) [Knowledge]
5. Two widely used serial data protocols for interfacing devices are I2C and SPI. List any two differences.
(CO3) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

5 X 10M = 50M

6. An IoT smart gate control application is to be deployed using a single node. Illustrating with diagram describe the IoT level 1 and IoT level 2 deployment templates for deploying the application
(CO1) [Comprehension]

7. A smart blood pressure monitoring application with network connectivity allows remote monitoring of patients health conditions to pre-determine vital medical diagnosis. Discuss any five technological challenges of designing the IoT application.

(CO1) [Comprehension]

8. A waste management requires computing at different layers for smart city application.

1. Describe the edge computing
2. Describe any two application of edge computing

(CO2) [Comprehension]

9. Sensors forms an essential component in the deployment of IoT application for sensing physical quantities. Discuss any five characteristics of sensors

(CO2) [Comprehension]

10. To interface a 16 bit Analog-to-Digital Converter (ADC) to Microcontroller using the Serial Peripheral Interface (SPI) it is required to comprehend the interface component and protocol.

1. Explain the SPI components
2. Describe the SPI protocol

(CO3) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

2 X 15M = 30M

11. A cloud model implementation for a health care application requires a scalable service model as per the National Institute of Standards and Technology (NIST). Formulate briefly describing the service models Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), and Infrastructure-as-a-Service (IaaS) for implementation of the application.

(CO2) [Application]

12. A weather monitoring system is designed to monitor temperature, and humidity that can help farmers to take appropriate decisions for the season. Design an IoT application illustrating the domain model specification explaining each components.

(CO3) [Application]