Register Number:……..

KUMARAGURU college of technology
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B.E/B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2024

(Regulation 2018)

Fourth Semester

COMMON TO ALL BRANCHES

U18CSR4202: IoT Protocols and Programming

COURSE OUTCOMES

CO1: Understand and Identify IoT protocols for real time applications.

CO2: Design and develop IoT prototypes using Arduino /Raspberry Pi.

CO3: Identify the challenges and security issues in developing IoT applications.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Explain the significance of Zigbee protocol in IoT networks.	CO1	[K_2]
2.	Define LPWAN and its role in IoT connectivity.	CO1	[K_2]
3.	Illustrate the WiFi protocol stack.	CO1	[K_2]
4.	Differentiate between MQTT and CoAP protocols.	CO2	[K_3]
5.	Explain the role of DDS in real-time data communication.	CO3	[K_2]
6.	Describe the layout of the NodeMCU board.	CO2	[K_2]
7.	How can NodeMCU be connected to a cloud platform?	CO2	[K_1]
8.	Discuss the security concerns in IoT applications.	CO3	[K_2]
9.	List the built-in I/O functions used in Arduino.	CO2	[K_1]
10.	Discuss the necessity of IoT prototyping.	CO3	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Describe the features and illustrate the network architecture of Zigbee protocol.	10	CO1	[K_2]
	b)	Compare the characteristics of SigFox and NB-IoT protocols.	06	CO1	[K_3]

12.	a)	Explain the protocol stack and network architecture of LoRaWAN protocol	10	CO1	[K_2]
	b)	Explain the architecture of SCADA.	06	CO1	[K_2]
13.	a)	Design a circuit and write a program for Arduino controller to implement smart street lighting system.	10	CO2	[K_3]
	b)	Explain the architecture of CoAP.	06	CO2	[K_2]
14.	a)	Develop an Arduino program to implement motion detection system using PIR sensor and buzzer.	10	CO2	[K_3]
	b)	Explain the process of programming Raspberry Pi using Python.	06	CO2	[K_2]
15.	a)	Design a motion detection system using RPi. Write a program for the same using Python RPi libraries.	10	CO2	[K_3]
	b)	List and discuss the technology challenges in IoT.	06	CO3	[K_1]
16.	a)	Consider the following scenario. In villages, people store their staple food for a long period in large containers or drums for a year. Many times, due to inappropriate moisture the wheat or rice gets damaged if not checked on time. On a larger view, many traders keep wheat or rice in sacks for long periods and sell all year round. They also face a similar problem. Thousands of sacks are piled up for months in large warehouses and the inappropriate moisture spoils them. Recommend an IoT solution in detail and list the components required to build a prototype for your solution.	10	CO3	[K_3]
	b)	Explain the various methods to overcome the challenges of privacy and trust in IoT.	06	CO3	[K_2]

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