KUMARAGURU
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B.E DEGREE EXAMINATIONS: APRIL / MAY 2023
(Regulation 2018)

Sixth Semester

INFORMATION SCIENCE AND ENGINEERING

U18ISE0005: IOT Architecture and Protocols

COURSE OUTCOMES

CO1: Appreciate the evolution and applications of IoT.

CO2: Evaluate the available sensors for an application and understand circuits.

CO3: Analyze different options for Embedded systems and understand the concept of MGC Architecture.

CO4: Analyze different connectivity and network protocol option and choose the appropriate one for a given application.

CO5: Deploy IoT devices that are integrated with services such as IoT Core, IoT Device Management and IoT Analytics.

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

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

1. Draw the IoT architecture.	CO1	[K2]
2. Name the characteristics of Embedded computing.	CO1	[K2]
3. List any four sensors used in IoT.	CO2	[K2]
4. What is the purpose of actuators in IoT?	CO2	[K1]
5. Define Cloud Ingest.	CO3	[K2]
6. List the Technology drivers used in the Embedded systems.	CO3	[K2]
7. Compare Computation and Communication.	CO4	[K2]
8. Recall the benefits of Massive Multiple Access.	CO4	[K1]
9. Name any three services associated with AWS IOT.	CO5	[K2]
10. Outline about AWS Deeplens?	CO5	[K2]

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

11.	a)	Miami-Dade County has had a strategic planning and performance measurement structure in place for twenty years. This approach is based on a countrywide strategic plan that crosses several service delivery areas including Public Safety, Transportation and Mobility, Health and Society, Neighborhood and Infrastructure, Recreation and Culture, Economic Development and General Government services. Through annual business planning and budgeting, our departments align their activities to the strategic plan, identify the performance measures related to the smart cities to gauge success and seek the resources needed to execute their plans.	8	CO1	[K_3]
	b)	A 54-year-old woman presents with a fever and myalgias. She experienced brief, self-limited diarrhea 24 hours after attending a barbecue two weeks earlier. She remained asymptomatic until the day prior to presentation when she developed a fever of 39.4 C (103 F), conjunctivitis, and severe muscle pain. On physical examination she appears acutely ill and has a fever of 39.4 C. Design a Healthcare system to monitor the elderly women remotely using the smart healthcare services.	8	CO1	[K_4]

12.	a)	Illustrate the major challenges associated with battery development for energy storage?	8	CO2	[K_2]

	b)	Write short notes on the following:
		    i. Sensors and Actuators
		    ii. Connecting Smart Objects
			8	CO2	[K_2]

13.	a)	Design a smart home automation system using IoT with the following features:
		    i. Remote Access
		    ii. Expandability
		    iii. Upgradability
		    iv. Strong dealer network
		    v. Energy management
		    vi. Cloud Storage connectivity
			8	CO3	[K_4]

	b)	Design an MGC Architecture for the smart e-health monitoring system. Illustrate the data analysis, cloud storage and energy efficient criteria for the sensor nodes with neat diagram.	8	CO3	[K_4]

14.	a)	Identify the connectivity challenges in IOT	8	CO4	[K_3]

b)   8   CO4   [K₃]

    i.   What drains the battery?

    ii.   Explain the Massive Multiple Access mechanisms used in the IoT. How the massive multiple access is achieved with the help of battery optimization.

15. a) Elaborate procedure to connect the 2 car things to IoT Core in the AWS Portal. Explain the IoT core services used in the connection.   8   CO5   [K₃]

    b) Write short notes on the following: 8   CO5   [K₂]

        i.   Amazon Lambda

        ii.   Amazon SNS

        iii.   Amazon S3

        iv.   AWS IoT rule.

16. a) Explain how IoT technology can be used to enable precision agriculture in the agricultural industry to increase operational efficiency, lower costs, reduce waste, and improve the quality of their yield.   8   CO1   [K₂]

    b) Illustrate how the IoT is impacting the healthcare sector and changing our everyday lifestyle with the following examples: 8   CO1   [K₂]

        (i)   Baby Monitoring

        (ii)   Health & Fitness monitoring

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