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B. M. S. College of Engineering, Bengaluru - 560019

Autonomous Institute Affiliated to VTU

JAN / FEB - 2021 Semester End Main Examinations

Programme: B.E. **Semester: V**
Branch : Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 20CS5PEIOT **Max Marks: 100**
Course: Internet of Things **Date: 23.02.2021**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - I

1. a) Explain IoT functional blocks with a neat diagram. **05**

   b) Identify and discuss the communication model and communication API that should be used for Live noise monitoring system. Choose the appropriate IoT level for the same system with justification. **10**

   c) Analyze the design requirements of an IoT system for tracking package handling and choose the appropriate IoT level with justification. **05**

UNIT - II

2. a) Discuss any five parameters to be considered while selecting sensors for an IoT system. **05**

   b) Design a smart street light system for the following scenario: **08**
      a) Light should be switched "ON" with full intensity when a human being is detected.
      b) Light should glow with half the intensity when a car passes with head lights "ON".

   c) Analyze how an IoT system can be developed which controls switching ON/OFF of an AC according to ambient temperature. **07**

OR

3. a) The 'shaft function sets the position of the servo motor according to potentiometer value. Write an Arduino program to implement the shaft function using servo motor and potentiometer. **05**

   b) Consider a scenario of a chemical factory where highly inflammable materials are used. Design an IoT system such that workers are automatically alerted by red light and sound in case fire is detected. **08**

   c) Write an Arduino sketch to design an automatic water bottle filling system. **07**

UNIT - III

4. a) Explain with a neat diagram the layer in IoT reference model where functionality focuses on North South communications. **05**

   b) Design an alert system for an office such that, if anyone enters the restricted area, floor incharge should get a call in his/her mobile and floor security guard should be alerted with a message in his mobile number. **10**

	c)	Justify the statement – "CoAP protocol stack is more suited for IoT environment than HTTP protocol stack".	**05**

OR

5.	a)	Write down the commands to Configure a ESP8266 module as an access point.	**05**
	b)	Analyze and name the headers in 6LoWPAN adaptation layer that are needed to support 1) Packet fragmentation & reassembly and 2) Link layer forwarding. Explain the header formats with a diagram. Explain the need of 6LowPAN adaptation layer.	**10**
	c)	Identify the appropriate level of QoS (in MQTT) suitable for the application which provides delivery guarantee with message duplication. Justify your answer with an appropriate diagram.	**05**

UNIT - IV

6.	a)	Describe the features of IoTivity.	**05**
	b)	Write a Python program to implement WAMP publisher and WAMP subscriber using AutoBahn framework.	**08**
	c)	Draw the sequence diagram to query a resource state in IoTivity framework with a brief explanation.	**07**

UNIT - V

7.	a)	Describe the features of Amazon auto scaling service.	**05**
	b)	Write a Python program to realize the working of Amazon SQS in AWS (Amazon Web Services).	**08**
	c)	Write a Python program for launching EC2 instance in AWS (Amazon Web Services).	**07**

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