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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: **16CS5DCIOT** Max Marks: **100**
Course: **Internet of Things** Date: **28.01.2021**

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

UNIT - I

1	a)	Explain IoT functional blocks.		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

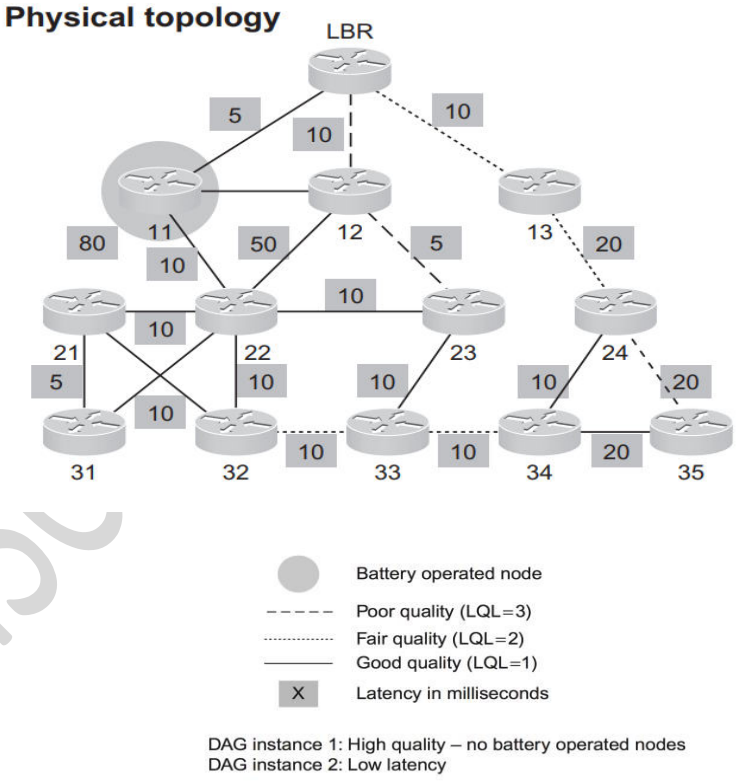
UNIT - II

2	a)	Discuss any five parameters to be considered while selecting sensors for an IoT system.		05
	b)	Design an alert system for 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.		08
	c)	Analyze how an IoT system can be developed to control switching ON/OFF a fan according to ambient temperature.		07
		OR		
3	a)	Discuss different types of tags used in RFID technology with relative advantages/disadvantages.		05
	b)	Design and implement a system to control multiple home appliances using Bluetooth technology.		08
	c)	Analyze how digital Read/Write pins behave like analog write pins considering the following circuit diagram: (LED- 9, Potentiometer – A0). Write the code for the given circuit.		07

UNIT- III

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

b) Construct DODAG instance, 10
i) Where DAG instance 1 should have high quality links - no battery operated nodes
ii) DAG instance 2 should ensure Low latency. Also mention the path taken from node 31 to LBR in case of two DODAG instance.



DAG instance 1: High quality – no battery operated nodes
DAG instance 2: Low latency

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

OR

5 a) Draw the sequence diagram to query a resource state in IoTivity framework with brief explanation. 05

b) Analyse and name the headers in 6LoWPAN adaptation layer that are needed to support : 10

i. Packet fragmentation & reassembly

ii. Link layer forwarding. Explain the header formats with a diagram and the need of 6LowPAN adaptation layer.

c) Identify the appropriate level of QoS(in MQTT) suitable for application which provides delivery guarantee with message duplication. Justify your answer with a diagram. 05

UNIT – IV

6 a) Describe Amazon SQS and Amazon DynamoDB. 05

b) Write a program in python to implement WAMP publisher and WAMP subscriber using AutoBahn framework. 08

c) Write a program in python for launching EC2 instance in AWS (Amazon Web Services). 07

UNIT-V

7 a) Explain Zigbee network model with a diagram. 08

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 of fire detection. 08

c) Write down the commands to Configure an ESP8266 module as access point. 04

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