U.S.N.										

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

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

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

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

UNIT - I

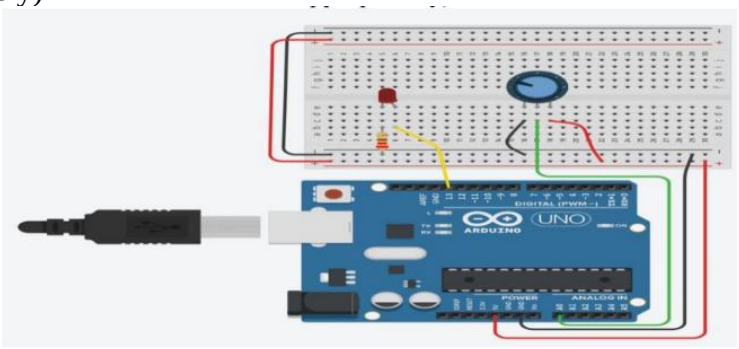
1	a)	Explain IoT functional blocks with a neat diagram.	**5**
	b)	Identify and discuss the communication model and communication API that should be used for Live noise monitoring systems. Choose the appropriate IoT level for the same system with justification.	**10**
	c)	Analyze the design requirements of an IoT system for tracking package handling and choose the appropriate IoT level with justification.	**5**

UNIT - II

2	a)	Discuss any five parameters to be considered while selecting sensors for an IoT system.	**5**
	b)	Design an alert system for the office such that if anyone enters the restricted area, floor incharge should get an alert at his place.	**8**
	c)	Analyze how an IoT system can be developed which controls switching ON/OFF of the fan according to ambient temperature.	**7**

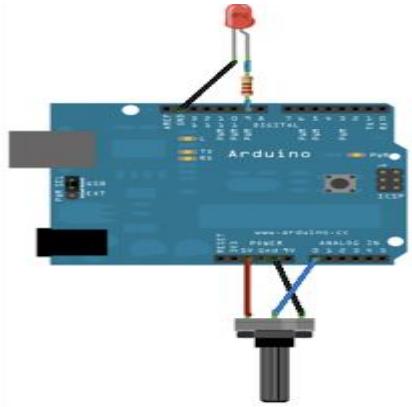
OR

3	a)	Analyze the following circuit and write the code: (Assume pin numbers appropriately)	**5**



	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.	**8**

c) **7**



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.

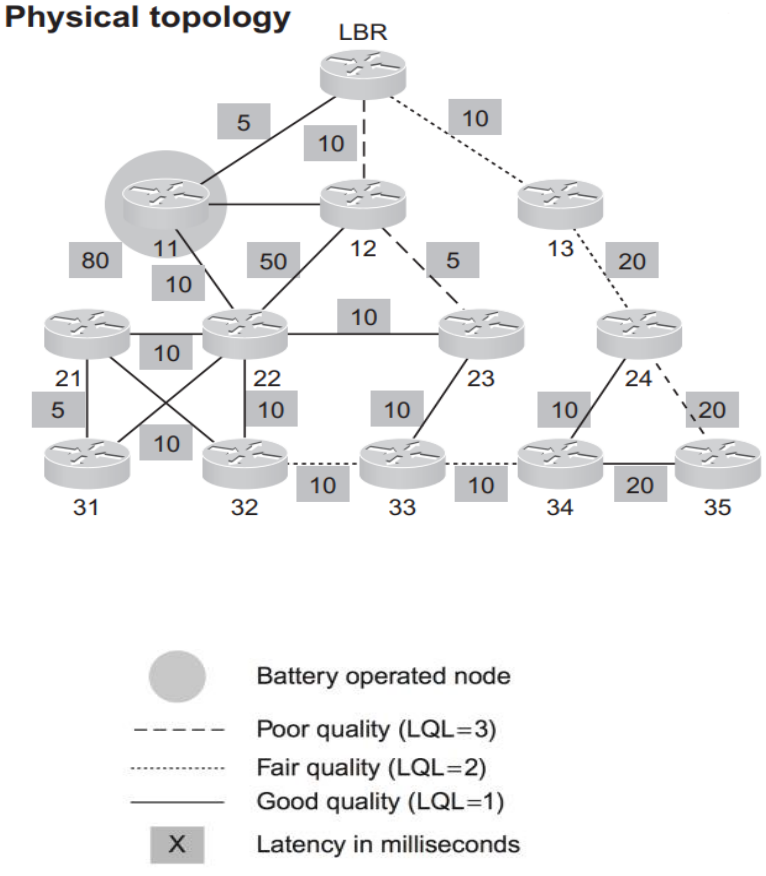
UNIT - III

4 a) Explain with a diagram the layer in the IoT reference model where functionality focuses on North South communications. **5**

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 instances.



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".	**5**

OR

5	a)	Write down the commands to Configure a ESP8266 module as access point.	**4**
	b)	Analyse 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 diagram. Explain the need of 6LowPAN adaptation layer.	**11**
	c)	Identify the appropriate level of QoS(in MQTT) suitable for application which provides delivery guarantee but message can be duplicated. Justify your answer with diagram.	**5**

UNIT - IV

6	a)	Draw the sequence diagram to query a resource state in Iotivity with brief explanation.	**5**
	b)	Write a Python program to implement WAMP publisher and WAMP subscriber using AutoBahn framework.	**10**
	c)	Explain the IoTivity software stack with neat diagram.	**5**

UNIT - V

7	a)	Write a Python program for launching and stopping EC2 instance in AWS(Amazon Web Services).	**7**
	b)	Write a Python program for launching an RDS service.	**6**
	c)	Write a Python program to create and write to Amazon SQS queue.	**7**

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