IoT QUESTION BANK

Module 1

1. What is the role of things and internet in IoT? 2 M

2. What is IoT? Explain components in IoT. 5 M

3. What are the differences between machines in M2M and Things in IoT?4M

4. Explain evolutionary phases of the internet. 4 M

5. Illustrate the challenges of IoT and their impact, with any 1 example. 5 M

6. Compare IT and OT networks with their challenges. 8 M

7. List and explain the challenges and problems that IoT is currently facing. 5 M

8. Explain oneM2M IoT Standardized Architecture with a neat diagram. 10 M

9. Explain the IoT architectural drivers. 5 M

10. With a neat diagram explain the IoTWF standardized architecture. 8 M

11. Explain in detail the expanded simplified IoT architecture. 8 M

12. Explain in detail the communication network layer. Illustrate the various access technologies with respect to distances. 5 M

13. Explain the 2 types of gateway and backhaul sublayers. 5 M

14. With a neat diagram explain the fog computing model along with its defining characteristics. 6M

15. a. What is edge computing? Explain with example. 5 M

b. Illustrate the hierarchy of edge, fog and cloud with a neat diagram. 5 M

Module 2

1. Explain the various network topologies with examples. 8 M

2. Explain the classification of smart objects with examples. 5 M

3. What is IEEE 802.15.4 protocol? How is it related to IoT? 4 M

4. Classify different types of sensors with examples. 7 M

5. a. list all the sensors used in a smart phone. 2 M

6. What is an actuator? Explain how sensors and actuators interact with the physical world. 5 M

7. Classify the actuator, with examples. 3 M

8. With a neat diagram, explain the characteristics of smart objects. List the trends in smartobjects. 8 M

9. What are SANETs? List its advantages. 5 M

10. List and explain different communication criterias in IoT. 8 M

11. Explain LoRaWAN layers and its architecture. 10 M

Module 3

1. List the advantages of Internet Protocol. 5 M
2. Explain with example MQTT Protocol. What is role of MQTT protocol in IoT? 8 M
3. Write a note on: CoAP, REST, and XMPP.
4. What are the differences between adaptation and adoption of the Internet Protocol? 5 M
5. Why optimization is necessary for Internet Protocol. 8 M
6. What are the differences between IPv4 and IPv6 in an IoT? 5 M
7. Write a note on: 6LoWPAN, 6TiSCH, RPL.
8. Explain authentication and encryption on constrained nodes. 4 M
9. Explain IoT application protocol and their transport methods. 10 M
10. List the categories of IoT application protocols and their transport methods. 4 M
11. Explain the problem and solution if application layer protocol layer not present. 4 M
12. Explain adapting SCADA for IP with DNP3 as a representative use case. 5 M
13. Explain raw socket scenarios for tunneling legacy SCADA over IP networks. 10 M
14. List the categories of IoT application protocols and their transport methods. 4 M
15. Explain the problem and solution if application layer protocol layer not present. 4 M
16. Explain adapting SCADA for IP with DNP3 as a representative use case. 5 M
17. Explain raw socket scenarios for tunneling legacy SCADA over IP networks. 10 M
18. Write a short note on profiles and compliances for IoT constrained nodes and networks. 10 M

Module 4

1. What is IoT data analytics and their challenges? 8 M
2. What are the common applications of machine learning of IoT. 4 M
3. Explain Big data analytics tools. 10 M
4. Comparison between Big Data, Edge Analytics and Network Analytics. 10 M
5. Explain Edge Analytics core functions. 5 M
6. What are the common challenges in OT security? 8 M
7. Explain the Purdue Model for Control Hierarchy. 6 M
8. Compare the nature of how traffic flows across IT and OT networks. 4 M
9. Explain Formal Risk Analysis Structures. 10 M
10. Explain security between Levels and Zones in the Process Control Hierarchy Model. 5 M

Module 5

1. How Arduino Uno is different from the other available microcontrollers? 5 M
2. What is Arduino Uno? Does the Arduino supports networking? 5 M

3. How is programming an Arduino different than standard C? 5 M

4. Explain with an example, a basic structure of Arduino programming. 5 M

5. Explain with an example the following methods: (Each one mark)

a. pinMode(pin,mode)

b. digitalRead(pin)

c. digitalWrite(pin,High)

d. analogRead(pin)

e. analogWrite(pin,value)

f. delay(ms)

g. millis()

h. min(x,y)

i. max(x,y)

j. randomseed(value)

k. random(min,max)

l. serial.begin(rate)

m. serial.println(data)

6. Write a note on DS18B20 temperature sensor. 5 M

7. Explain with a neat sketch, the following use cases:

8. Street lighting architecture 7 M

9. Smart parking 7 M

10. Smart traffic control 7 M

11. With a neat diagram, explain a four layered architecture of a smart city IoT Infrastructure. 10 M

12. Differentiate between Analog, Digital and PWM pins. 5 M

13. What is a raspberry pi? What OS does raspberry pi use? 2 M

14. How to configure OS setup on raspberry pi. 5 M

15. Explain Raspberry pi2 model B and its General Purpose I/O (GPIO) 10 M

16. Explain general commands for raspberry pi.

UID

Module 5

1. Explain general guidelines for layout windows and pages

2. Explain border guidelines in window organization and layout.

3. What is the scope of testing and importance of usability testing

4. What are the advantages and disadvantages of hand sketches.

5. Explain heuristic evaluation.

6. Explain test plan.

7. List usability test guidelines

8. Write a note on hypermedia

9. What is visualization?. Explain knowledge visualization and techniques

10. Explain any two software testing tools.