Ch1:

1.What is Internet of Things?

2.What is the meaning of digitization? How it improves human value.

3.What are the major components of the Internet of things?

4.What are the Pros and cons of the Internet of things?

5.What are the impacts of the Internet of things?

6.Compare with suitable parameters M2M and IoT.

7.Give the Challenges Being Addressed by Connected Roadways.

8.What is the industrial internet of things?

9.What is meaning of smart factory?

10. What are the main challenges facing manufacturing in a factory environment today?

11. What parameters will possible to address by IoT in Smart buildings.

12. Explain the few specific ways connected IoT solutions will continue to drive the growth of smart buildings.

13. What is digital ceiling in smart building?

14. Explain how IoT is helpful to create smart creatures.

15. Compare with suitable parameters Operational Technology (OT) and Information Technology (IT).

16. Explain the different challenges in IoT.

17. Explain in detail the oneM2M IoT Standardized Architecture.

18. Explain in detail a seven-layer IoT architectural reference model published by IoTWF Standardized architectural committee.

19. Explain Design considerations and Data related problems in IoT system.

20. Explain important requirement to be considered in design of IoT system.

21. What is Fog computing?

22. Give characteristics of fog computing along with its advantages and disadvantages.

23. What is Edge computing? Give the driving factors for the adoption and use of edge Computing.

24. Explain benefits and drawbacks of Edge computing.

25. Explain the Hierarchy of Edge, Fog and Cloud with respect to IoT.

26. Explain the key areas which created disruptions in IoT technology.

CH2

1.What you mean by sensing and sensor?

2.What is meaning of transducer?

3.Enlist the working principles of sensors.

4.Enlist the different categories of sensors and explain any one in detail.

5.Enlist the types of sensors and give its applications.

6.Explain the different characteristics of sensors?

7.What is meaning of actuators?

8.Explain the attributes of actuators.

9.What is meaning of smart object? Explain the characteristics of smart object.

10. Draw and explain the IoT sensor node architecture.

11. Explain the parameters that affect the trends in smart objects in IoT.

12. What is Sensor networks?

13. Draw and explain architecture of wireless sensor network.
14. What are the network topologies used in wireless sensor networks?
15. What is RFID?
16. Is RFID better than using bar codes?
17. What have the initial benefits of RFID technology been?
18. In what ways are companies using RFID today?
19. What are some of the most common applications for RFID?
20. What information is stored on RFID tags?
21. What's the difference between passive and active tags?
22. What is the read range for a typical RFID tag?
23. What are micro-electro-mechanical systems (MEMS)? Give its advantages.
24. Explain the various applications of MEMS.
25. How does an RFID system work?
26. What is the difference between low-, high-, and ultra-high frequencies?
27. What Does NFC Stand For? How Does It Work? What Radio Frequency Does It Use?
28. Compare RFID with NFC.
29. Explain the main differences between classic Bluetooth and Bluetooth Low Energy (BLE).
30. Enlist the applications of BLE in IoT.
31. What are the advantages and disadvantages of BLE**?**
32. Compare LTE with LTE-A with suitable parameters.
33. What is IEEE 802.15.4?
34. Explain Protocol Stacks that utilizing IEEE 802.15.4.

35. What is 6LoWPAN?

36. What is WirelessHART?

37. What is ZigBee? Give advantages and disadvantages of it.

38. Compare BLE with ZigBee with suitable parameters for your IoT solution.

CH3

1.Differentiate between sensors and actuators.

2.Describe different properties of sensors.

3.Describe communication network layer.

4.What is a need for an access network layer?

5.Describe IoT Network Management Sublayer.

6.Differentiate Analytics Vs. Control Applications.

7.Differentiate Data Analytics Vs. Business Benefits.

8.What are Smart Devices? Explain with the industrial examples.

CH4

1.Describe IoT Application Transport methods.

2.What is SCADA? State its purpose.

3.Describe Tunneling Legacy SCADA over IP Networks.

4.What are different generic web based protocols? Explain any one in detail.

5.Differentiate CoAP and MQTT.

CH5

1.What are the different applications in IoT?

2.Explain Intrusion Detection system.

3.Explain Healthcare monitoring system in detail.

4.Describe Smart Roads in India.

5.Write short note on “Energy Smart Grids”.

6.Explain the process of Agriculture Smart Irrigation system.

7.Q.7 Describe Industry Machine Diagnostics & Prognosis.

8.Q.8 Write short note on “Fitness Monitoring and Wearable Electronics”.

9.Q.8 Explain the Retail Inventory Management system with Smart Payments process.

CH6

1.What you mean by IoT hardware?

2.Explain the Hardware design challenges of the embedded IoT devices.

3.With suitable diagram explain the building blocks of IoT Device Hardware.

4.Enlist and explain different types of widespread open source hardware platform used for IoT projects.

5.What is Arduino? Give advantages and disadvantages of Arduino hardware platform.

6.Explain the Arduino ecosystem.

7.Give the features and specification of Arduino Yun hardware board.

8.What is Raspberry Pi? Give the advantages and disadvantages of Raspberry Pi.

9.Enlist the models available in market place of RaspberryPI.

10. Compare Raspberry Pi Zero WH, Raspberry Pi 3 B+, Raspberry Pi 4B, Raspberry Pi 400, Raspberry PI Pico, Raspberry Pi Zero 2W with suitable parameters.

11. Explain the features and specification of ESP32.

12. What is the Cloudbit/Littlebits hardware?
13. Explain the features and specification of Particle Photon IoT hardware.
14. Explain the features and specification of the Beaglebone Black IoT hardware.
15. Compare with suitable parameters ESP8266 Vs. ESP32 Vs. ESP32-S2.
16. What is the features of IoT software?
17. What are the key components of an IoT Application Enablement Platform?
18. Enlist and explain any five Programming Languages used for IoT Development.
19. What you mean by IoT middleware? Explain it's features.
20. Explain the Characteristics of open source IoT middleware.
21. Draw and explain the IoT middleware architecture.
22. What is open source IoT middleware platforms? Explain it's benefits.
23. Explain the consideration for developing a generic API.
24. Explain at least five APIs for the Internet of Things available in market place.
25. Explain how REST and JSON-LD are utilized in the IoT software development.
26. What are the parameters to be considered while developing front-end for IoT applications?
27. Compare any five IoT boards and platforms in terms of computing.
28. Compare any five IoT boards and platforms in terms of development environments and communication standards.
29. Compare any five IoT boards and platforms in terms of connectivity.
30. Compare any five IoT software platforms