IoT QB for MT:

Lecture 1

1- Define IoT
2- List the IoT Architecture Layers
3- In the IoT architecture, the data is collected through the _____ layer and transferred over the _____ layer to cloud servers and users connect to the system through _____ layer.
4- Draw typical diagram of IoT Architecture.
5- Define Perception (Sensing) Layer and provide five examples of IoT sensors.
6- Define Network Layer
7- Define Application Layer
8- Define Sensors
9- Data produced from _____ is then electronically transformed, by another device, into information (output) that is useful in _____ done by devices or individuals.
10- What are the selection factors and challenges of IoT Sensors?
11- What are the selection factors and challenges of IoT Networks?
12- Define Intelligent Analysis and list the challenges of IoT Intelligent Analysis.
13- List five of IoT Application Domains.

Lecture 2

1. The IoT hardware are _____ that make IoT possible
2. List four reasons to learn About IoT Hardware?
3. IoT sensors converts _____ about the environment into _____.
4. Compare between Active and Passive sensors.
5. List seven types of sensors and provide a brief about their functions and applications.
6. Describe three types of actuators used in IoT and how they function.
7. What are the common power sources for IoT devices?
8. What are the two IoT applications that depend on mains electricity?
9. Batteries are a common solution for _____ IoT devices. The application will determine if it makes sense to use _____ or _____ batteries.
10. Define Harvesting (Renewable Sources), and list some of the types indicating the most common one.
11. Microcontrollers and microcomputers act as the _____ of smart devices.
12. Compare between Microcontrollers and Microcomputers
13. A microcontroller typically has very little _____ compared to microcomputers.
14. What are the main differences between Raspberry Pi and Arduino?
15. How does Raspberry Pi use Python in IoT development?
16. The 40-pin header on Raspberry Pi is called _____.
17. The basic Python editor that comes with Raspberry Pi OS is called _____.

Lecture 3

1- The IoT protocol stack can be mapped to the _____ layers in the _____ model.
2- IoT smart devices connect through the _____ to connect to the application server.
3- _____, MQTT, CoAP, and XMPP are examples of application layer protocols.
4- UDP and TCP are _____ layer protocols.
5- RPL, IPv6, and IPv4 are examples of _____ layer protocols.
6- _____ is the adaptation layer in the IoT stack.
7- Bluetooth is based on the IEEE _____ standard, with theoretical transfer rate of _____ and a range of _____ and the frequency band is _____ and _____ address.
8- In Bluetooth, _____ mechanism associate & authenticate is used, with master _____, slave _____, where multiple devices can connect to same _____.
9- _____ standard is a base for Base for ZigBee, Thread, WirelessHART.
10- IEEE 802.15.4 bitrate is up to _____, with a range _____, and it uses different frequency bands: _____, _____, and _____.
11- IEEE 802.15.4 MAC addresses size are _____ or _____.

12- Explain the main purpose of Z-Wave protocol.
13- Z-Wave operates in the _____ frequency band and flows the standard _____ with data rate up to _____.
14- List the Z-wave Layers and brief each one of them.
15- Explain the difference between Z-Wave controllers and slaves
16- What are LPWANs, and give an example of a long-range protocol used for LPWANs?
17- Define LoRaWAN and Sigfox and brief each one of them.
18- Compare between LoRaWAN and Sigfox?
19- IPv6 uses _____ bit addresses.
20- Why IPv6 is useful for IoT?
21- List the challenges for using IPv6 over 802.15.4
22- 6LoWPAN provides _____ of IPv6 packets into 802.15.4 frames.
23- List the main features of 6LoWPAN.
24- Compare and contrast TCP and UDP.
25- _____ is a transport layer protocol that provides error control and flow control.
26- List three of IoT Application Layer Protocols.
27- Define CoAP.
28- CoAP is based on _____ model and works over _____
29- CoAP is similar to HTTP and runs over _____ .
30- CoAP architecture is divided into two main sub-layers: _____, and _____.
31- CoAP is a Client-Server interaction with server as _____, and client is _____.
32- Draw the CoAP Architecture diagram.
33- MQTT is based on _____ model and works over _____
34- Describe the Publisher-Subscriber model

35- Draw the MQTT Architecture diagram.
36- Define XMPP
37- XMPP is based on _____ and _____ model.
38- _____ is a IoT short-range protocol.
39- XMPP is used for transmission of _____, _____, and _____.
40- Draw the XMPP Architecture diagram.