1. What is the Internet of Things - IoT?

- The Internet of things is simply the network to which heterogeneous devices or things are connected and which are accessible from anywhere.

2. What is the full form of IIoT?
- Industrial Internet of Things

3. What is data in IoT?
- Data in IoT refers to the information that is collected by the installed devices.

4. Give some examples of the things that are connected to the internet?

- Smart watch, Smart doorbell, IoT Logger, Smart Lights, Smart Fans, Smart Access Control System.

5. What is the internet?

- A media that connects all the clients to the servers.

6. What are the layers of IoT network infrastructure?

- Application layer, Transport layer, Network Layer, Data Link layer, Physical Layer.

7. Write about some options available in the application layer of the internet network?

- MQTT, HTTP, CoAP, AMQP, FTP, SMTP

8. What is the full form of FTP?

- File Transfer Protocol

9. What are the options in the transport layer?

- TCP, UDP

10. What is the full form of TCP?

- Transmission Control Protocol

11. What is the full form of UDP?

- User Datagram Protocol

12. What is the element of the network layer?

- Internet Protocol

13. Elements for the data link layer?

- Network Switch, Router

14. What are the options in the physical layer?

- LAN cables, Wireless Systems

15. What are the available wired options for IoT physical connectivity?

- LAN cables, Optical fibers, Serial cables

16. Wireless options for IoT connectivity?

- LPWAN, Cellular network, Bluetooth, WiFi, Zigbee

17. Which connectivity is licensed for LPWAN?

- NB-IoT

18. Which connectivities are not licensed yet for LPWAN?

- LoRa, Sigfox

19. In which fields LPWAN can be applied?

- Industrial IoT, Smart meter, Smart city, Smart building, Smart Agriculture.

20. In which fields cellular networks can be applied for IoT implementation?

- Industrial IoT, Connected health, Logistics & Tracking.

21. In which fields Zigbee can be applied for implementation?

- Industrial IoT, Smart Building, Smart home.

22. In which fields bluetooth can be used?

- Smart home, wearables, connected health, smart retail.

23. In which field WiFI can be used?

- Smart home, Connected car, Smart retail.

24. In which fields RFID can be used?

- Smart retail, Logistics & Tracking

25. Which are the basic components of IoT?

- Server, Client, Gateway

26. What is the server in an IoT infrastructure?

- A computer placed in a remote area which runs an application to communicate with the client.

27. What is the gateway in IoT?

- A media through which a client or a server connects to the internet.

28. What is the client in an IoT infrastructure?

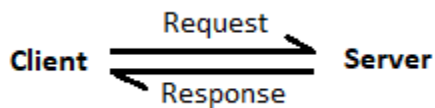- A hardware device dedicated to an application that connects to a server through the internet.

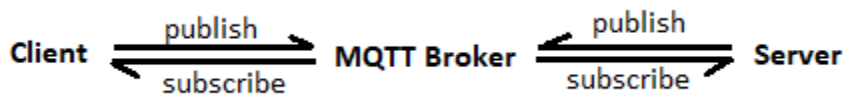**29. What is the full form of HTTP?**

- HyperText Transfer Protocol

30. What is the full form of MQTT?

- Message Queue Telemetry Transport.

31. Show a sample diagram of HTTP?

-

32. Show a sample diagram of MQTT?

-

33. Write some name of MQTT broker?

- Mosquitto, HiveMQ, EMQ

34. What is Electronics?

- It's a branch which works with semiconductor components to manipulate electrons.

35. Which are the main parts of electronics?

- Analog electronics, Digital electronics.

36. Which are the main power sources for electronics?

- Alternating current (AC), Direct Current (DC)

37. Give some examples of DC current sources?

- DC Adapters, Lead Acid Batteries, Li-ion batteries, Li-po batteries, Adjustable power supplies.

38. Give some examples of analog electronics components?

- Resistor, Diode, LED, Relays, Transistors, Regulators, FET, MOSFET

39. What is the full form of FET?

- Field Effect Transistor

40. What is the full form of MOSFET?
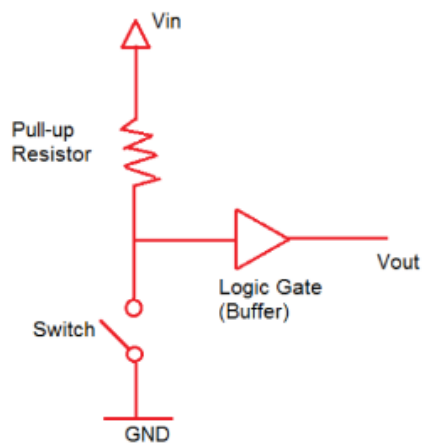
- Metal Oxide Semiconductor Field Effect Transistor

41. GIve examples of digital electronics?
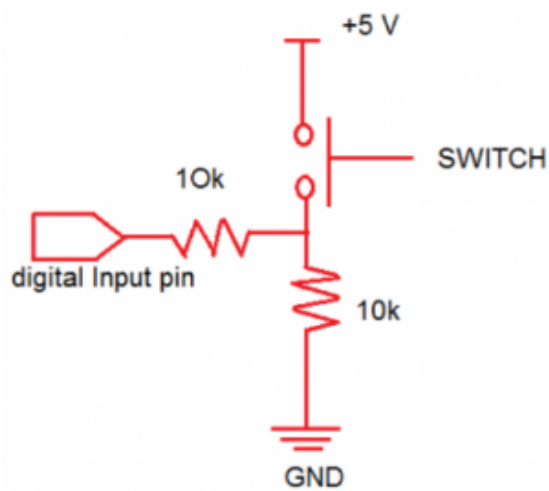
- Programmable Integrated Chips (IC), Microcontrollers.

42. List a few prototyping components?

- Breadboard, Jumper cables, development modules.

43. Draw circuitry of a pull up switch?

-

44. Draw circuitry of a pull down switch?

-

45. What is computer programming?

- A set of instructions that can be executed by the computers.

Sample C program

```c
#include <stdio.h>

Int sum = 0;

Int main()

{

}

Int sum()

{

      Int total;

}
```

46. In the above program which portion is a preprocessor directive?

- #include <stdio.h>

47. In the above program which one is a global variable?

- int sum = 0;

48. In the above program which one is a local variable?

- int total;

49. Which one is a user defined function?

- sum()

50. What are the compilation steps of a C program?

- Preprocessing, compiling, assembling, linking, locating

51. What does preprocessor do?

- pre process #define #ifdef #ifndef #include directives.

52. What does the compiler do?

- generates assembly programs.

53. What does assembler do?

- Converts assembly program to machine code.

54. What does linker do?

- links program files & generates one file.

55. What does the locator do?

- memory mapping of the linker file.

56. Which one is used for embedded devices or application specific devices? Microcontroller or Microprocessor?

- Microcontroller

57. Which one needs external memory to interface? Microcontroller or Microprocessor?

- Microprocessor

58. Which one is needed for advanced data processing, computer vision type of applications? Microcontroller or Microprocessor?

- Microprocessor

59. What are the in-built components of a microcontroller?

- CPU, RAM, ROM, Interrupt controller, Oscillator, Serial Bus, Timer

60. What is the full form of CPU?

- Central Processing Unit

61. What is the full form of RAM?

- Random Access Memory

62. What is the full form of ROM?

- Read Only Memory

63. What are the system memories for embedded controllers?

- Registers, Cache, SRAM/RAM, Flash, Tape/Disk

64. What are the evolutions of program memory?

- ROM -> PROM -> EPROM -> EEPROM -> Flash

65. Which memory is volatile?

- RAM

66. Which memory is non-volatile?

- ROM or EEPROM or Flash

67. Which cloud service is provided by Amazon to implement IoT?

- Amazon AWS IoT Platform

68. Which cloud service is provided by Google to implement IoT?

- Google IoT Cloud Platform

69. Which cloud service is provided by Microsoft to implement IoT?

- Microsoft Azure IoT Platform

70. Write some examples of popular cloud services?

- Oracle IoT
- Salesforce IoT
- Cisco Cloud Connect

71. Which sensor can be used to detect flame or smoke?

- Gas sensor

72. Which sensor can be used to measure light intensity?

- LDR sensor

73. Which sensor can be used to measure temperature?

- DHT11, LM35

74. Which sensor can be used to measure humidity?

- DHT11

75. Which sensor can be used to detect motion?

- PIR sensor

76. Which sensor can be used to measure distance?

- Sonar sensor.

77. Which module is used to generate real time?

- RTC module.

78. Which language was used in your course to write an application for the client?
- C program.

79. Which language was used in your course to write an application for the server site?
- Python.

80. Which software was used to write applications for the client?
- Arduino IDE

81. What is the Arduino library?
- Arduino library is a collection of code that is already written for controlling modules or sensors.

82. What are the interfaces available in ESP8266?
- Analog, Digital, UART, USART, I2C, SPI

83. What is the full form of UART?
- Universal Asynchronous Receiver Transmitter.

84. What is the full form of USART?
- Universal Synchronous Asynchronous Receiver Transmitter

85. What is the full form of SPI?
- Serial Peripheral Interface.

86. Which feature of the controller is used to drive a DC motor?
- PWM

87. What is the full form of PWM?
- Pulse Width Modulation

88. What is the purpose of GPIO?

- To read or write data using different hardware interfaces.

89. What is the full form GPIO?

- General Purpose Input Output

90. Why is an interrupt used?

- An interrupt is used to execute predefined tasks in between regular tasks.

91. Which python module is used to run the server?

- Flask

92. Write about some sectors where IoT played a major role?

- Manufacturing,Transportation, Healthcare, Consumer electronics

93. What are the major challenges of IoT?

- Power utilization & security.

94. What are the biggest implementations of IoT till now?

- Self driven cars, Smart homes.

95. How many analog pins are there in ESP8266 Node MCU?

- One

96. Total GPIO pins in ESP8266?

- 17 pins

97. Which controller can be used for IoT applications with WiFi?

- ESP8266 Node MCU

98. Which module can be used for IoT applications with cellular networks?

- GPRS modules. Ex. SIM800, SIM900

99. Give some examples of databases to use in IoT applications?

- MySQL, SQLite, MongoDB, CrateDB

100. Write some applications of the Internet of Things?

- Smart Homes
- Smart City
- Self-driven Cars
- IoT Retail Shops
- Farming
- Wearables
- Smart Grids
- Industrial Internet
- Telehealth
- Smart Supply-chain Management
- Traffic management
- Water and Waste management