Developed in	1981	1998
Address Length	32bit	128bit
Binary representation in	Decimal	Hexadecimal
Addressing method	Numeric	Alphanumeric
Binary Bits are separated by	Dot (.)	Colon (:)

Ques159. What is 6LOWPAN?

Ans. It stands for IPv6 over Low Power Wireless Personal Area Network.

It is really the first wireless connectivity standard that was created for the IOT. The main aim of the protocol is to enable the smallest devices to use the internet protocol. Data Rates 250Kb/s.

Ques160. Difference b/w TCP and UDP.

Ans.

TCP	UDP
1. Connection-Oriented Protocol	1. Connectionless Protocol
2. It is reliable as it guarantees the delivery of data to the destination router.	2. It is unreliable as delivery of data to the destination cannot be guaranteed in UDP.
3. It is slower than UDP	3. It is faster than TCP
4. It does error checking and also makes error recovery.	4. It performs error checking , but it discard error's packets
5. It has acknowledgement segments	5. It does not have acknowledgement segments
6. It is heavy weight	6. It is lightweight
7. TCP used by HTTP, HTTPs, FTP, SMTP and Telnet	7. UDP is used by DNS, DHCP, TFTP, SNMP, RIP, and VoIP.





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Ch-2 Things and Connections

One Word Question's

Ques1. A control system in which the control action is somehow dependent on the output is known as.

Ans. Closed loop system.

Ques2. Traffic light system is an example of Open-loop system?

Ans. Open-loop system

Ques3. A closed loop system is distinguished from open loop system by?

Ans. Feedback

Ques4._____is a IETF standard?

Ans. CoAp

Ques5.What is the full form of IETF ?

Ans. Internet Engineering Task Force

Ques6.CoAp is supported by?

Ans. UDP

Ques7. Cloud computing save his data on

Ans. Internet

Ques8. _____ is used in wired communication?

Ans. Ethernet

Ques9. _____and_____ are used in wireless communication?

Ans. Bluetooth and WiFi

Ques10. Fibre optics is a _____network?

Ans. wired

Ques11. Microwave is a _____network?

Ans. Wireless

Ques12. RFID is a _____technology?

Ans. Bluetooth

Ques13. Bluetooth operates in:

Ans. short range

Ques14.What is the standard length of MAC address?

Ans. 48 bits

Ques15._____directly interact with the End user?

Ans. Application layer

Ques16.What is the Ethernet/LAN cable used in RPi ?

Ans. RJ45

Ques17. Ethernet frame consists of

Ans. MAC Address

Ques18. Wireless mode connects machines directly to one another without the use of an acce$s point.

Ans. Ad hoc

Ques19.____,___and___are the strong security protocol?

Ans. HTTPS, SSL and SFTP.

Ques20. WSN depends on _____connectivity?

Ans. Wireless.

Ques21. What is the full form of WSN?

Ans. Wireless Sensor Network

Ques22. What is the core wrapper of GSN?

Ans. Zero MQ Wrapper

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Ques23.____supports low energy radio operation .
Ans. Bluetooth

Ques24.____services are the way in which the IOT is connected to data .
Ans. Cloud

Ques25. Which enables seamless integration of Lo-WPAN devices with internet leveraging.
Ans. IETF 6LoWPAN

Ques26. IOT gateway must provide.
Ans. Protocol abstraction

Ques27._____Is based on publish-subscribe architecture.
Ans. MQTT

Ques28. TCP/IP model does not have
Ans. Session Layer

Ques29.Which wireless technology provides mesh network architecture in easiest way.
Ans. Zigbee

Ques30.The WIMAX uses ____and ____standard specification.
Ans. IEEE 802.16d and IEEE 802.16g

Ques31. OSI model, the transport layer is only
Ans. Connection oriented

Ques32.___, ____and____ are the LPWAN technologies.
Ans. Sigfox, NB-IOT and LORA

Ques33. ____and ___ is not LPWAN technology.
Ans. WiFi

Ques34. The core element is operated by:
Ans. IOT service provider

Ques35.Which can be divided into the data access network and the core network.
Ans. Smart Network Layer

Ques36. In_____ various application platforms are built as required by the services needs of smart grid.
Ans. Smart Application Layer

Ques37. Monitor target of the smart includes sensor objects in the power link.
Ans. Perception Layer

Ques38. __interacts with the Device.
Ans. Physical Layer

Ques39. Which protocols does the secure digital card application use.
Ans. SPI

but OSI model have this layer.

Ques40.____,_____ ,____ are the standard protocol used in IOT domain.
Ans. WiFi, Z-Wave, Zigbee

Ques41._____is not a standard protocol used in IOT domain.
Ans. LoMe

Ques42.____ and____are the advantage of MQTT over HTTP?
Ans. More secure, Lightweight.

Ques43.What are the lower layer in the IOT Architecture?
Ans. Smart Devices

Ques44. In_____ layer various application platforms are built as required by the services needs of smart grid.
Ans. Smart Application

Ques45. The frequency rate of Z-Wave is?
Ans. 908.42 GHz.

Ques46. The range of Z-Wave?
Ans. 30 to 100m

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Ques47. A network of physical objects or things embedded with electronics or software is:
Ans. IOT

Ques48. Which standard defines physical layer (PHY) and (MAC) layer for low rate wireless devices, which are typical IOTs?
Ans. IEEE 802.15.4

Ques49. Which standard defines physical layer (PHY) and (MAC) layers specification for wireless connectivity?
Ans. IEEE 802.15.1

Ques50. Which layer concerns with packets?
Ans. Network Layer

Ques51. Data in network layer is transferred in the form of?
Ans. Packets

Ques52. Hardware Address is known as?
Ans. MAC Address

Ques53. Which level is the Network layer in the OSI Model?
Ans. Third Level

Ques54.Which is the communication layer that connects the IOT devices with WAN.
Ans. Network Layer

Ques55.What are the two versions of IP.
Ans. IPV4 and IPV6

Ques56. Version 6 of IP address has bits.
Ans. 128 bits

Ques57. Version 4 of IP address has bits.
Ans. 32 bits

Ques58. The original IEEE 802 MAC address comes from .
Ans. Ethernet address

Ques59. MAC address is used in the form of:
Ans. Network address

Ques60. UDP and TCP are called _____ protocols.
Ans. Transport Layer

Ques61. Bits from physical layer are converted into frames by the
Ans. Data Link Layer

Ques62. Which layer provides a security based connection?
Ans. Transport layer

Ques63. Transmission media are usually categorized as :
Ans. Guided or Unguided

Ques64. A wireless network uses ____waves to transmit signals.
Ans. Radio waves

Ques65. End to end connection is established by which protocol of the TCP/IP suite?
Ans. TCP protocol

Ques66. Which type of cable has glass center core.
Ans. Fiber-Optic

Ques67. The inner core of an optical fiber is____ or _____ in composition.
Ans. Glass or Plastic

Ques68. BAN gives ____and____ .
Ans. Communication, Storage

Ques69. Which control system has only one input and one output.
Ans. SISO (Single Input Single Output)

Ques70. According to the analysis on IoT application frame work, smart grid is divided into:
Ans. 3 layers

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Ques71. Internet domain name and hostname are translated into IP address by:
Ans. Domain Name system

Ques72. Which device connects multiple computers into a network.
Ans. Switch

Ques73. The Z-waves uses radio frequency for:
Ans. control, signaling

Ques74. Router operate at which layer of OSI reference model.
Ans. 3rd layer

Ques75. WMN can also be a form of
Ans. Wireless ad hoc

Ques76.____ enables open application layer for constrained nodes.
Ans. IEFT COAP

Ques77. Who monitors user activity on internet and transmits that information in the background to someone else.
Ans. Spyware

Ques78.____is a system designed to prevent unauthorized access in a computer networks.
Ans. Firewall

Ques79. The energy source used in WSN are.
Ans. Battery

Ques80.____ is a Plug-in type device.
Ans. USB

Ques81. A process that selects paths for traffic in a network is called_____.
Ans. Routing

Ques82. Which sensor is used to Measure distance.
Ans. Proximity sensor

Ques83. Bluetooth will transmit the data over the frequency band:
Ans.2.4 to 2.485 GHz.

Ques84. The internet layer generally corresponds to ____layer of OSI Model.
Ans. Network Layer

Ques85. Radio Identification technology is being used by:and_____.
Ans. Internet of Things

Ques86.Which protocol is the Sensor/protocol used in GSN.
Ans. CoAP

Ques87. RS232C protocols is used by:network
Ans. USART

Ques88. Wireless speakers works on
Ans. Sensor

Ques89. Which is a security mechanism in WIFI?
Ans. WPA

Ques90.____and____is a protocol related to IOT.
Ans. CoAP, ZigBee

Ques91.___, ____and ____are the mostly used protocols in IOT.
Ans. Zigbee, XMPP, MQTT

Ques92. Which protocol interacts asynchronously over UDP?
Ans. COAP

Ques93. Which Layer is the "Central Nervous System" that takes care of global services in the IOT.
Ans. Network layer

Ques94. How many wires does the SPI

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protocol use?
Ans. 4 Wire

Ques95. Which protocols exits in every host or router. The router examines the header fields of all the IP packets that pass through it.
Ans. Network layer

Ques96. Which type of elements helps in streaming XMPP.
Ans. XML

Ques97.___,___and____ are the short range wireless network.
Ans. Bluetooth, Wi-Fi, Hotspot

Ques98._____is not a short range wireless network.
Ans. VPN

Ques99._____are the solar system and Digestive system.
Ans. Natural control system

Ques100. The Data Link layer that arranges signals into logical units of information called_____.
Ans. Frames

Ques101. WIFI uses frequency.
Ans. 2.4 GHz

Ques102. _____ performs two functions toward the delivery of the services.
Ans. Global Scheduler

Ques103. _____ is a Temperature sensor.
Ans. DS18B20

Ques104. What wireless technologies used in IoT which consumes the least amount of power.
Ans. Bluetooth

Ques105. WSN require _____.
Ans. sensing unit, processing unit and communication unit

Ques106.____ is the OSI Layer
Ans. Physical layer

Ques107. _____ are the characteristics of WSN.
Ans. Heterogeneity, Homogeneity and Ease of use

Ques108.Which protocol provide full-duplex communication.
Ans. Websocket

Ques109. Bluetooth 5.0 promises:
Ans. 2x Speed, 4x Range, 8x Data

Ques110. The different wireless standards used in cellular networks are:
Ans. a) GSM b) CDMA c)LTE

Ques111. MQTT was created by:
Ans. Andy Stanford-Clark
?

Ques112. Two wire interface is also called as.
Ans. I2C

Ques113. MQTT is protocol.
Ans. Machine to Machine and Internet of Things protocol

Ques114. The RFID is a useful IOT Architecture layer of the perception layer for_____
Ans. Object Identifying, Tracking, and Exchange useful Information.

Ques115. _____is designed specifically for Low data rate, Long range sensors and

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controllers.
Ans. WIFI-ah (HaLow)

Ques116._____is Message oriented.
Ans. MQTT

Ques117. An automatic toaster is a ____loop control system.
Ans. Open loop

Ques118. USART is a serial port allows communication between___ and____.
Ans. Arduino, Computer

Ques119._____supports Both point-to-point connections and point-to- multipoint connection.
Ans. Bluetooth

Ques120. Bluetooth is the wireless technology for
Ans. Personal Area Network

Ques121. DNS Database contains_____ and_____.
Ans. Host name aliases, Host name-to-address records and name server records

Ques122. Routing is performed in_____ all are the type of networks.
Ans. Circuit-switched, Public switched telephone network and computer network

Ques123.____layer represents how various devices are physically connected to the network.
Ans. Physical

Ques124. Sonos is a system that uses
Ans. HiFi

Ques125._____is the way in which an IoT device is associated with data.
Ans. Cloud

Ques126. Which topology is used for ZigBee Smart Energy?
Ans. Star

Ques127. UART stands for:
Ans. Universal Asynchronous Receiver/ Transmitter

Ques128. Standard ports of MQTT are:
Ans. TCP/IP

Ques129. _____tags, devices, smart phones useful in identification.
Ans. RFID/NFC

Ques130. TCP stands for:
Ans. Transmission Control Protocol

Ques131. The IOT networks that has a very short range is:
Ans. Short-range Wireless Network

Ques132. _____helps to collaborate in IOT development.
Ans. Cloud computing

Ques133. Edge computing allow:
Ans. data processing close to device

Ques134.Which is the challenge arises when we use many devices on the same network.
Ans. Power Consumption

Ques135. In IOT, Transport layer set up connections without handshakes/ acknowledgement using.
Ans. UDP

Ques136. IOT and cloud computing has which kind of relationship?
Ans. Complementary

Ques137. Which is an established set of rules that determines how data is transmitted between different devices in the same network?
Ans. Network protocol

Ques138. HC-05 is a Bluetooth module that wireless speakers.

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can communicate in .
Ans. Full-Duplex mode

supply.
Ans. USB connection

Ques139. Raspberry pi use_____for power

Ques140. Which are the leading Cloud services for IOT Deployments but Google drive is not leading cloud services for IOT Deployments.
Ans. AWS, IBM Watson and Microsoft Azure

Ques141. Which are the threat modeling methodology but NANO is not threat modeling methodology.
Ans. STRIDE, OCTAVE and PASTA

Important Abbreviations:-

1.	**6LoWPAN**	IPv6 Low-power Wireless Personal Area Network
2.	**AMQP**	Advanced Message Queuing Protocol
3.	**BAN**	Body Area Network
4.	**BLE**	Bluetooth Low Energy
5.	**DARPA**	Defence Advanced Research Projects Agency
6.	**DHCP**	Dynamic Host Communication protocol
7.	**HART**	Highway Addressable Remote Transducer
8.	**HDLC**	High Level Data Link Control
9.	**I2C**	Inter-Integrated Circuit
10.	**IaaS**	Infrastructure as a Service
11.	**IANA**	Internet Assigned Numbers Authority
12.	**ICT**	Information and Communication Technology
13.	**IP**	Internet Protocol
14.	**ISO**	International Standard Organization
15.	**ITS**	Intelligent Transportation Services
16.	**LLC**	Logical Link Control
17.	**LORA**	Long Range Radio
18.	**LoRaWAN**	Long Range Wide Area Network
19.	**LPWAN**	Low-Power Wide Area Network
20.	**LTE**	Long Term Evolution
21.	**MAC**	Media Access Control
22.	**MEMS**	Micro Electro-Mechanical Systems
23.	**MISO**	Master Input Slave Output
24.	**MOSI**	Master Output Slave Input
25.	**MQTT**	Message Queue Telemetry Transport
26.	**NB-IOT**	Narrow Band Internet of Things
27.	**NFC**	Near Field Communication
28.	**NIC**	Network Interface Card
29.	**OSI**	Open System Interconnection

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30.	**RFID**	Radio Frequency Identification
31.	**RS232**	Recommended Standard 232
32.	**SDLC**	Synchronous Data Link Control
33.	**SMQTT**	Secure Message Oueue Telemetry Transport
34.	**SPI**	Serial Peripheral Interface
35.	**TCP**	Transmission Control Protocol
36.	**UART**	Universal Asynchronous Transmitter and Receiver
37.	**USART**	Universal Synchronous/Asynchronous Transmitter and Receiver
38.	**USB**	Universal Serial Bus
39.	**VNC**	Virtual Network Computing
40.	**VPN**	Virtual Private Network
41.	**WIFI**	Wireless Fidelity
42.	**WLAN**	Wireless Local Area Network
43.	**WMN**	Wireless Mesh Network
44.	**WPS**	Wi-Fi Protected Setup
45.	**UDP**	User Datagram Protocol

MCQ Questions

Ques142. In open loop system
Ans.
a) The control action depends on the size of the system.
b) The control action depends on system variables
c) The control action depends on the input signal
d) The control action is independent of the output

Ques143. Which of the following is an open loop control system?
Ans.
a) Field controlled D.C motor
b) Ward leonard control
c) Metadyne
d) Stroboscope

Ques144. The major characteristics on which OSI and TCP/IP differs:
Ans.
a) OSI model is independent generic protocol & TCP/IP is communication
b) In OSI model, Transport layer guarantees the delivery
c) Both (a) and (b)
d) TCP/IP model consists of 7 layers

Ques145. Closed Loop Control System has one or more ____between its output and input?
Ans. a) Control loops
b) Feedback loops
c) Controller loops
d) Feedback loops

Ques146. _____ is a closed loop system.
Ans. a) Auto-pilot for an aircraft
b) Direct current generator
c) Car starter
d) Electric Switch

Ques147. Which protocol is lightweight?
Ans. a) MQTT b) HTTP
c) COAP d) SPI

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Ques148. Which one of the following layer is responsible for connecting smart network devices, and server?

Ans. a) Session layer b) Perception layer
c) Application layer d) Network layer

Ques149. Finger print sensor uses which interface?

Ans. a) USART Protocol b) UART Protocol
c) SPI Protocol d) All of the Above

Ques150. IOT enabled technologies include following.

Ans. a) Security Protocol
b) Wireless Sensor Networks
c) Cloud Computing
d) All of these

Ques151. Which of the following lot network very short range?

Ans. a) Short Network
b) LPWAN
c) Sig Fox
d) Short-range Wireless N/w

Ques152. The differences in an open-loop systems are based on:

Ans. a) Feedback b) Complexity
c) Stability d) All of these

Ques153. Which type of IOT communication bi-directional and fully duplex?

Ans. a) Publish-Subscribe
b) Request-Response
c) Exclusive Pair
d) Push Pull

Ques154. Internet of Things needs a IOT of network connection. What is the proposed "White Space" radio standard called?

Ans. a) Weightless b) Wimax
c) Bluetooth d) Zigbee

Ques155. What is the access point (AP) in wireless LAN?

Ans.
a) Device that allows wireless devices to connect to a wired network
b) Wireless devices itself
c) Both (a) and (b)
d) None of the above

Ques156. What is the basic function of the spring in a control valve?

Ans.
a) Characterize flow
b) Oppose the diaphragm to position the valve according to signal pressure
c) Close the valve if air failure occurs
d) Open the valve if air failure occurs

Ques157. The examples of Open-loop system in control system are:

Ans.
a) Traffic Light, Toaster
b) Traffic Light, Temperature Controller
c) Traffic Light, Automatic washing machine
d) All of these

Ques158. Following layer is not mentioned in TCP/IP Model.

Ans. a) Presentation b) Network
c) Application d) Transport

Ques159. Stochastic control system has

Ans.
a) Feedback with unknown random actions
b) Positive Feedback with unknown random actions
c) Negative Feedback with unknown random actions
d) All of these

Ques160. Which is not a characteristic of TCP/IP Model?

Ans. a) Connection-oriented protocol
b) Implements flow control
c) Support for a flexible architecture
d) Unreliable

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Ques161. Which protocol is used to link all the devices in the IoT?
Ans. a) TCP/IP b) Network
c) UDP d) HTTP

Ques162. Which of the following is false about IOT devices?
Ans.
a) IoT devices use the internet for collecting and sharing data
b) IoT devices need microcontrollers
c) IoT devices use wireless technology
d) IoT devices are completely safe

Ques163. The communication technologies used for IoT is/are:
Ans. a) Bluetooth b) Zigbee
c) WIMAX d) All of these

Ques164. What is mandatary for an IP Packet to contain?
Ans. a) Only Destination IP Address
b)Only Source IP Address
c)Source and destination IP addresses
d)None of the Above

Ques165. Which of the following layer is called a port layer in OSI model?
Ans. a) Application b) Presentation
c) Transport d) Session

Ques166. Which Transport layer protocol is used by DHCP?
Ans. a) RSVP b) TCP
c) DCCP d) UDP

Ques167. The RFID technology consists of ?
Ans. a) Antenna b) Transponder
c) Transceiver d) All of the Above

Ques168. Which layer is used for wireless connecting in IoT devices?
Ans. A) Application Layer b) Network Layer
c) Data Link Layer d) Transport Layer

Ques169. The IoT supports?
Ans.
a) Cloud computing
b) Block-chain Technology
c) Data Analytics
d) All of these

Ques170. IOT supports communication.
Ans. A) Wired
b) Wireless
c) Wired and Wireless
d) None of these

Ques171. Which of the following layers provides end-to-end communication in IOT?
Ans. A) Logical Layer b) Data Link Layer
c) Transport Layer d) Session Layer

Ques172. MQTT suits are ?
Ans.
a) Small and Cheap devices
b) Low power devices
c) Low memory devices
d) All of the Above

Ques173. Which of the following communication medium supports highest data rate?
Ans. a) Ethernet b) Bluetooth
c) Optical Fiber d) Wi-fi

Ques174. Which address schemes are used by Ipv4 and Ipv6 internet protocols?
Ans.
a) 128-bit and 16-bit
b) 32-bit and 128-bit
c) 32-bit and 64-bit
d) 16-bit and 128 bit

Ques175. Which of the following is not a TCP/IP layer?
Ans. a) Application Layer b) Transport Layer
c) Network Layer d) Data Link Layer

Ques176. What is true about sending and receiving the Serial TTL Signals?

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Ans.
a) At least one serial port is there
b) Communicates on digital input, 0(Rx) and 1(Tx)
c) UART or USART
d) All of these

Ques177. The role of public cloud computing in the IOT architecture is:
Ans.
a) Need for on-premises hosting
b) Remote processing power
c) Enhanced inter-device communication
d) Both (b) and (c)

Ques178. The wireless network types that promote IOT deployment in industries are?
Ans. A) Cellular (2G-5G) network protocols
b) Bluetooth
c) Near-field communication
d) All of these

Ques179. Identify among the following which is not a data link layer technology?
Ans. a) UART b) Wi-fi
c) Bluetooth d) HTTP

Ques180. An IOT Protocol does not include:
Ans.
a) Network/Internet protocol layer
b) Link layer protocol
c) Application layer protocol
d) Session layer protocol

Ques181. What is Inter-Integrated communication (I2C):
Ans.
a) An application layer protocol.
b) A networking communication protocol for multi-master support.
c) An OS for distributed network communication.
d) A cellular communication protocol.

Ques182. Which of the following protocols does not exist at the data link layer?
Ans.
a) ZigBee Smart Energy b) LoRaWAN
c) Wireless HART d) Secure MQTT

Ques183. IOT devices are vulnerable to attacks and threats. One of them is Cryptanalysis attack that means?
Ans.
a) By recovering the encryption information
b) Inject malicious codes
c) Find chiphertext to break the encryption
d) Temper with the hardware

Ques184. In which message format is the statue line present?
Ans.
a) Response message b) Request message
c) Both (a) and (b) d) Neither (a) or (b)

Ques185. WOT reduces the of HTTP:
Ans. a) Load b) Overload
c) Overhead d) Overrun

Ques186. Which layer of the OSI model does data compression?
Ans. a) Network b) Data link
c) Physical d) Presentation

Ques187. Which application layer protocol is responsible for machine to machine communication in restricted environment?
Ans. a) MQTT b) COAP
c) XMPP d) AMQP

Ques189. This output signal is feedback so that it subtract from the input signal.
Ans.
a) Negative feedback
b) Positive feedback
c) Both (a) and (b)
d) None of the Above

Ques190. The Wireless battery free sensor designed to record environmental and

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material temperature is:

Ans. a) DHT11 b) ESP8266
c) RFM3200 d) LM35



Ques191. The IOT temperature monitoring is related to:

Ans.
a) Analog to Digital Conversion
b) Save Time
c) Real Time System
d) All of the mentioned

Ques192. Which is the best for internet connected thermostat.

Ans.
a) Honeywell
b) GE connected appliances
c) Eversens
d) Nest



Ques193. In the IoT network, Secure Shell (SSH) is :

Ans. a) Gateway b) Secure network protocol
c) Router d) Firewall

Ques194. I2C is implemented by?

Ans. a) Motorola b) Phillips
c) IBM d) Microsoft



Ques195. SPI is developed by

Ans. a) Motorola b) Phillips
c) IBM d) Microsoft

Ques196. Development year of I2C is:

Ans. a) 1999 b) 1998
c) 1980 d) 2008

Ques197. OSI model was developed by:

Ans. a) ISO b) IBM
c) Google d) Microsoft



Ques198. How many layers in OSI model?

Ans. a) 4 b) 5
c) 6 d) 7

Ques1999. ZigBee standard is:

Ans. a) 802.11 b) 802.15.4
c) 802.13 d) 802.13.2

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