Set-I

Q1. Which of the following services is not provided by wireless access point in 802.11 WLAN ?

(1) Association (2) Disassociation (3) Error correction (4) Integration

Q2. Which of the following fields in IPv 4 datagram is not related to fragmentation ?

(1) Type of service (2) Fragment offset (3) Flags (4) Identification

Q3. Four channels are multiplexed using TDM. If each channel sends 100 bytes/second and we multiplex 1 byte per channel, then the bit rate for the link is_____.

(1) 400 bps (2) 800 bps (3) 1600 bps (4) 3200 bps

Q4. In a typical mobile phone system with hexagonal cells, it is forbidden to reuse a frequency band in adjacent cells. If 840 frequencies are available, how many can be used in a given cell?

(1) 280 (2) 210 (3) 140 (4) 120

Q5. Using p = 3, q = 13, d = 7 and e = 3 in the RSA algorithm, what is the value of ciphertext for a plaintexts?

(1) 13 (2) 21 (3) 26 (4) 33

June 2015

Q6. Which of the following protocols is an application layer protocol that establishes, manages and terminates multimedia sessions ?

(1) Session Maintenance Protocol

(2) Real – time Streaming Protocol

(3) Real – time Transport Control Protocol

(4) Session Initiation Protocol

Q7. Match the following port numbers with their uses :

List-I List-II

(a) 23 (i) World wide web

(b) 25 (ii) Remote Login

(c) 80 (iii) USENET news

(d) 119 (iv) E-mail

Codes :

(a) (b) (c) (d)

(1) (iv) (i) (ii) (iii)

(2) (ii) (i) (iv) (iii)

(3) (ii) (iv) (iii) (i)

(4) (ii) (iv) (i) (iii)

Q8. Which of the following is not associated with the session layer?

(1) Dialog control

(2) Token management

(3) Semantics of the information transmitted

(4) Synchronization

Q9. What is the size of the 'total length' field in IPv 4 datagram ?

(1) 4 bits (2) 8 bits (3) 16 bits (4) 32 bits

Q10. Which of the following is/are restriction(s) in classless addressing ?

(1) The number of addresses needs to be a power of 2.

(2) The mask needs to be included in the address to define the block.

(3) The starting address must be divisible by the number of addresses in the block.

(4) All of the above

Q11. The period of a signal is 10 ms. What is its frequency in Hertz ?

(A) 10 (B) 100

(C) 1000 (D) 10000

Q12. In a classful addressing, first four bits in Class A IP address is

(A) 1010 (B) 1100

(C) 1011 (D) 1110

Q13. Which of the following algorithms is not a broadcast routing algorithm ?

(A) Flooding (B) Multidestination routing

(C) Reverse path forwarding (D) All of the above

Q14. An analog signal has a bit rate of 6000 bps and a baud rate of 2000 baud. How many data elements are carried by each signal element ?

(A) 0.336 bits/baud (B) 3 bits/baud

(C) 120,00,000 bits/baud (D) None of the above

Q15. How many distinct stages are there in DES algorithm, which is parameterized by a 56-bit key ?

(A) 16 (B) 17

(C) 18 (D) 19

Q16. Infrared signals can be used for short range communication in a closed area using propagation.

(A) ground (B) sky

(C) line of sight (D) space

Q17. A bridge has access to address in the same network.

(A) Physical (B) Network

(C) Datalink (D) Application

Q18. The minimum frame length for 10 Mbps Ethernet is _____ bytes. and maximum is____ bytes

(A) 64 & 128 (B) 128 & 1518

(C) 1518 & 3036 (D) 64 & 1518

Q19. The bit rate of a signal is 3000 bps. If each signal unit carries 6 bits, the baud rate of the signal is .

(A) 500 baud/sec

(B) 1000 baud/sec

(C) 3000 baud/sec

(D) 18000 baud/sec.

Q20. Match the following:

List-I List – II

a. Physical layer i Allow resources to network access

b. Datalink layer ii Move packets from one destination to other

c. Network layer iii. Process to process message delivery

d. Transport layer iv. Transmission of bit stream

e. Application Layer v. Formation of frames

Codes:

a b c d e

(A) iv v ii iii i

(B) v iv i ii iii

(C) i iii ii v iv

(D) i ii iv iii v

Dec 2013

Q21.When data and acknowledgement are sent in the same frame, this is called as

(A) Piggy packing

(B) Piggy backing

(C) Back packing

(D) Good packing

Q22. Encryption and Decryption is the responsibility of Layer.

(A) Physical

(B) Network

(C) Application

(D) Datalink

Q23. An analog signal carries 4 bits in each signal unit. If 1000 signal units are sent per second, then baud rate and bit rate of the signal are and

(A) 4000 bauds \ sec & 1000 bps

(B) 2000 bauds \ sec & 1000 bps

(C) 1000 bauds \ sec & 500 bps

(D) 1000 bauds \ sec & 4000 bps

Q24. The VLF and LF bauds use propagation for communication.

(A) Ground (B) Sky

(C) Line of sight (D) Space

Q25. Using the RSA public key crypto system, if p = 13, q = 31 and d = 7, then the value of e is

(A) 101 (C) 105

(B) 103 (D) 107

Q26. Which of the following addresses is used to deliver a message to the correct application program running on a host?

(A) Port

(B) IP

(C) Logical

(D) Physical

Q27. In substitution, a character in the plaintext is always changed to the same character in the ciphertext, regardless of its position in the text.

(A) polyalphabetic

(B) monoalphabetic

(C) transpositional

(D) multialphabetic

Q28. In classful addressing, the IF address 190.255.254.254 belongs to

(A) Class A

(B) Class B

(C) Class C

(D) Class D

Q29. In hierarchical routing with 4800 routers, what region and cluster sizes should be chosen to minimize the size of the routing table for a threelayer hierarchy?

(A) 10 clusters, 24 regions and 20 routers

(B) 12 clusters, 20 regions and 20 routers

(C) 16 clusters, 12 regions and 25 routers

(D) 15 clusters, 16 regions and 20 routers

Q30. In IPv4 header, the field is needed to allow the destination host to determine which datagram a newly arrived fragments belongs to.

(A) identification

(B) fragment offset

(C) time to live

(D) header checksum

Dec 2012

Q31. The Mobile Application Protocol (MAP) typically runs on top of which protocol?

(A) SNMP (Simple Network Management Protocol)

(B) SMTP (Simple Mail Transfer Protocol)

(C) SS7 (Signalling System 7)

(D) HTTP (Hyper Text Transfer Protocol)

Q32. If a packet arrive with an M-bit value is ‘1’ and a fragmentation offset value ‘0’, then it is_____ fragment.

(A) First

(B) Middle

(C) Last

(D) All of the above

Q33. The number of bit strings of length eight that will either start with a 1 bit or end with two bits 00 shall be

(A) 32

(B) 64

(C) 128

(D) 160

Q34. The design issue of Datalink Layer in OSI Reference Model is

(A) Framing

(B) Representation of bits

(C) Synchronization of bits

(D) Connection control

Q35. Data Encryption Techniques are particularly used for .

(A) protecting data in Data Communication System.

(B) reduce Storage Space Requirement.

(C) enhances Data Integrity.

(D) decreases Data Integrity.

Q36. Networks that use different technologies can be connected by using

(A) Packets

(B) Switches

(C) Bridges

(D) Routers

Q37. Both hosts and routers are TCP/IP protocol software. However, routers do not use protocol from all layers. The layer for which protocol software is not needed by a router is

(A) Layer – 5 (Application)

(B) Layer – 1 (Physical)

(C) Layer – 3 (Internet)

(D) Layer – 2 (Network Interface)

Q38. Which of the following TCP/IP Internet protocol is diskless machine uses to obtain its IP address from a

server ?

(A) RAP

(B) RIP

(C) ARP

(D) X.25

Q39. Decryption and encryption of data are the responsibility of which of the following layer ?

(A) Physical layer

(B) Data Link layer

(C) Presentation layer

(D) Session layer

Q40. In which circuit switching, delivery of data is delayed because data must be stored and retrieved from RAM ?

(A) Space division

(B) Time division

(C) Virtual

(D) Packet

Q41. In which Routing Method do all the routers have a common database ?

(A) Distance vector

(B) Link state

(C) Link vector

(D) Dijkestra method

Q42. Page Shift Keying (PSK) Method is used to modulate digital signal at 9600 bps using 16 level. Find the line signals and speed (i.e. modulation rate).

(A) 2400 bauds

(B) 1200 bauds

(C) 4800 bauds

(D) 9600 bauds

Hint: D = R/b or D = R/log2 L

where D= modulation rate in baud ; R data rate in bps; L number of different signal elements; b number of bits per signal element

Q43. The station to hub distance in which it is 2000 metres.

(A) 100 Base-Tx

(B) 100 Base-Fx

(C) 100 Base-T4

(D) 100 Base-T1

(D) None of the above

Q44. Mobile IP provides two basic functions.

(A) Route discovery and registration

(B) Agent discovery and registration

(C) IP binding and registration

(D) None of the above

Q45. Hub is a term used with

(A) A Star Networks

(B) A Ring Networks

(C) A Router

(D) A Bridge

Q46. The amount of uncertainty in a system of symbol is called

(A) Bandwidth (B) Entropy (C) Loss (D) Quantum

Q47. Which of the following network access standard disassembler is used for connection station to a packet switched network ?

(A) X.3 (B) X.21 (C) X.25 (D) X.75

Q48. A station in a network in a network forward incoming packets by placing them on its shortest output queue. What routing algorithm is being used ?

(A) Hot potato routing

(B) Flooding

(C) Static routing

(D) Delta routing

Q49. Start and stop bits are used in serial communications for

(A) Error detection

(B) Error correction

(C) Synchronization

(D) Slowing down the communication

Q50. The number of bits required for an IPV 6 address is

(A) 16 (B) 32 (C) 64 (D) 128

June 2011

Q51. A comparison of frequency division and time division multiplexing system shows that

(A) FDM requires a lower bandwidth, but TDM has greater noise immunity.

(B) FDM has greater noise immunity and requires lower bandwidth than TDM.

(C) FDM requires channel synchronization, while TDM has greater noise immunity.

(D) FDM requires more multiplex while TDM requires band pass filter.

Q52. If carrier modulated by a digital bit stream, has one of the possible phase of 0, 90, 180 and 270 degrees, then modulation called

(A) BPSK (B) QPSK (C) QAM (D) MSK

Q53. Consider the following statement :

(i) The bandwidth of the A.M., wave depends on the band width of the modulating signal.

(ii) The bandwidth of the A.M., wave depends on the modulation index.

(iii) The bandwidth of the F.M, wave for all practical purpose depends on the amplitude of the carrier.

Of these statements the correct statements are

(A) (i, ii)

(B) (i, iii)

(C) (ii, iii)

(D) All of the above

Q54. A smart modem can dial, hangup and answer incoming calls automatically. Can you tell who provides the appropriate instructions to the modem for this purpose ?

(A) Communication software

(B) Error detection protocols

(C) Link access procedure (LAP)

(D) Telecommunications

Q55. Which of the following switching techniques is most suitable for interactive traffic ?

(A) Circuit switching

(B) Message switching

(C) Packet switching

(D) All of the above

Q56. Frequency shift keying is used mostly in

(A) Radio transmission

(B) Telegraphy

(C) Telephone

(D) None of the above

Q57. The baud rate is

(A) always equal to the bit transfer rate

(B) equal to twice the bandwidth of an ideal channel

(C) not equal to the signalling rate

(D) equal to half of the bandwidth of an ideal channel

Q58. How much bandwidth is there in 1 micron of spectrum at a wavelength of 1 micron ?

(A) 300 MHz

(B) 3 GHz

(C) 300 THz

(D) 30 KHz

Q59. Which of the following file transfer protocols use TCP and establishes two virtual circuits between the local and remote server ?

(A) FTP

(B) TFTP

(C) TELNET

(D) NFS

Q60. The threshold effect in demodulator is

(A) exhibited by all demodulator, when the input signal to noise ratio is low.

(B) the rapid fall on output signal to noise ratio when the input signal to noise ratio fall below a particular value.

(C) the property exhibited by all A.M. suppressed carrier coherent demodulator.

(D) the property exhibited by correlation receiver.

Q61. The _____ field is the SNMP PDV reports an error in a response message.

(A) error index

(B) error status

(C) set request

(D) agent index

Q62. What does the URL need to access documents?

I. Path name

II. Host name

III. DNS

IV. Retrieval method

V. Server port number

(A) I, II, III (B) I, III, V (C) I, II, IV (D) III, IV, V

Q63. End-to-End connectivity is provided from Last-to-Last in

(A) Network layer

(B) Session layer

(C) Transport layer

(D) Data link layer

Q64. What services does the internet layer provide ?

1. Quality of service

2. Routing

3. Addressing

4. Connection oriented delivery

5. Framing bits

(A) 1, 2, 3 (B) 2, 3, 4 (C) 1, 3, 4, 5 (D) 2, 3, 4, 5

Q65. What is the maximum operating rate of a wireless LAN using infrared communication?

(A) 1 mbps (B) 2 mbps (C) 5 mbps (D) 11mbps

Set-III OSI MODEL

Which of the following transport layer protocols is used to support electronic mail?
(A) SMTP
(B) IP
(C) TCP
(D) UDP

Answer: (C)

Explanation: E-mail uses SMTP as application layer protocol.
TCP and UDP are two transport layer protocols. SMTP uses TCP as transport layer protocol as TCP is reliable.
2. The number of layers in ISO OSI reference model is _____
a) 4
b) 5
c) 6
d) 7
Answer: d
Explanation: In OSI reference model, there are 7 layers namely Application, Presentation, Session, Transport, Network, Data Link and Physical layer. Each layer uses a protocol to perform its designated function, for example, the data link layer uses error detection protocols for error control functions.

3. TCP/IP model does not have _____ layer but OSI model have this layer.
a) session layer
b) transport layer
c) application layer
d) network layer
Answer: a
Explanation: In OSI reference model, there are two layers which are not present in TCP/IP model. They are Presentation and Session layer. The functions of Presentation and Session layer in the OSI model are handled by the transport layer itself in TCP/IP.

4. Which layer is used to link the network support layers and user support layers?
a) session layer
b) data link layer
c) transport layer
d) network layer
Answer: c
Explanation: Physical, data link and network layers are network support layers and session, presentation and application layers are user support layers. The transport layer links these layers by segmenting and rearranging the data. It uses protocols like TCP and UDP.

5. Which address is used on the internet for employing the TCP/IP protocols?
a) physical address and logical address
b) port address

c) specific address
d) all of the mentioned
Answer: d
Explanation: The physical, logical, port and specific addresses are used in TCP/IP protocol. All the addressing schemes, that is physical (MAC) and logical address, port address and specific address are employed in both TCP/IP model and OSI model. In TCP/IP, the addresses are more focused on the internet implementation of these addresses.

6. TCP/IP model was developed _____ the OSI model.
a) prior to
b) after
c) simultaneous to
d) with no link to
Answer: a
Explanation: Several TCP/IP prototypes were developed at multiple research centers between 1978 and 1983, whereas OSI reference model was developed in the year 1984. TCP/IP was developed with the intention to create a model for the Internet while OSI was intended to be a general network model.

7. Which layer is responsible for process to process delivery in a general network model?
a) network layer
b) transport layer
c) session layer
d) data link layer
Answer: b
Explanation: The role of Transport layer (Layer 4) is to establish a logical end to end connection between two systems in a network. The protocols used in Transport layer is TCP and UDP. The transport layer is responsible for segmentation of the data. It uses ports for the implementation of process-to-process delivery.

8. Which address is used to identify a process on a host by the transport layer?
a) physical address
b) logical address
c) port address
d) specific address
Answer: c
Explanation: A port number is a way to identify a specific process to which an Internet or other network message is to be forwarded when it arrives at a server. Some examples of port numbers are port 20 which is used for FTP data, port 22 which is used for SSH remote login ,and port 23 which is used for TELNET.

9. Which layer provides the services to user?
a) application layer
b) session layer
c) presentation layer
d) physical layer
Answer: a
Explanation: In networking, a user mainly interacts with application layer to create and send information to other computer or network. Application layer provides the

interface between applications and the network. It is the top-most layer in both the TCP/IP and the OSI model.

10. Transmission data rate is decided by _____
a) network layer
b) physical layer
c) data link layer
d) transport layer
Answer: b
Explanation: Physical layer is a layer 1 device which deals with network cables or the standards in use like connectors, pins, electric current used etc. Basically the transmission speed is determined by the cables and connectors used. Hence it is physical layer that determines the transmission speed in network. Some of the cables used for high speed data transmission are optical fiber cables and twisted pair cables.

SET-IV BASIC

1. The IETF standards documents are called _____
a) RFC
b) RCF
c) ID
d) DFC
Answer: a
Explanation: RFC stands for Request For Comments and they are documents that describe methods, behaviors, research, or innovations applicable to the working of the Internet.

2. In the layer hierarchy as the data packet moves from the upper to the lower layers, headers are _____
a) Added
b) Removed
c) Rearranged
d) Modified
Answer: a
Explanation: Each layer adds its own header to the packet from the previous layer. For example, in the Internet layer, the IP header is added over the TCP header on the data packet that came from the transport layer.

3. The structure or format of data is called _____
a) Syntax
b) Semantics
c) Struct
d) Formatting
Answer: a
Explanation: The structure and format of data are defined using syntax. Semantics defines how a particular pattern to be interpreted, and what action is to be taken based on that interpretation. In programming languages, syntax of the instructions plays a vital role in designing of the program.

4. Communication between a computer and a keyboard involves _____ transmission.
a) Automatic
b) Half-duplex
c) Full-duplex
d) Simplex
Answer: d
Explanation: In simplex transmission, data flows in single direction which in this case refers to the data flowing from the keyboard to the computer. Another example would be of the mouse where the data flows from the mouse to the computer only.

5. The first Network was called _____
a) CNNET
b) NSFNET
c) ASAPNET
d) ARPANET
Answer: d
Explanation: ARPANET stands for Advanced Research Projects Agency Networks. It

was the first network to be implemented which used the TCP/IP protocol in the year 1969.

6. A _____ is the physical path over which a message travels.
a) Path
b) Medium
c) Protocol
d) Route
Answer: b
Explanation: Messages travel from sender to receiver via a physical path called the medium using a set of methods/rules called protocol. Mediums can be guided (wired) or unguided (wireless).

7. Which organization has authority over interstate and international commerce in the communications field?
a) ITU-T
b) IEEE
c) FCC
d) ISOC
Answer: c
Explanation: FCC is the abbreviation for Federal Communications Commission. FCC is responsible for regulating all interstate communications originating or terminating in USA. It was founded in the year 1934.

8. Which of this is not a network edge device?
a) PC
b) Smartphones
c) Servers
d) Switch
Answer: d
Explanation: Network edge devices refer to host systems, which can host applications like web browser. A switch can’t operate as a host, but as a central device which can be used to manage network communication.

9. A _____ set of rules that governs data communication.
a) Protocols
b) Standards
c) RFCs
d) Servers
Answer: a
Explanation: In communications, a protocol refers to a set of rules and regulations that allow a network of nodes to transmit and receive information. Each layer in the network model has a protocol set, for example, the transport layer has TCP and UDP protocols.

10. Three or more devices share a link in _____ connection.
a) Unipoint
b) Multipoint
c) Point to point
d) Simplex
Answer: b
Explanation: A multipoint communication is established when three or many network

nodes are connected to each other. Frame relay, Ethernet and ATM are some examples of multipoint connections.

SET-IV

1. When collection of various computers seems a single coherent system to its client, then it is called _____
a) computer network
b) distributed system
c) networking system
d) mail system

Answer: b
Explanation: A Computer network is defined as a collection of interconnected computers which uses a single technology for connection.
A distributed system is also the same as computer network but the main difference is that the whole collection of computers appears to its users as a single coherent system.
Example:- World wide web

2. Two devices are in network if _____
a) a process in one device is able to exchange information with a process in another device
b) a process is running on both devices
c) PIDs of the processes running of different devices are same
d) a process is active and another is inactive

Answer: a
Explanation: A computer network, or data network, is a digital telecommunications network which allows nodes to share resources. In computer networks, computing devices exchange data with each other using connections between nodes. The nodes have certain processes which enable them to share a specific type of data using a distinct protocol.

3. Which of the following computer networks is built on the top of another network?
a) prior network
b) chief network
c) prime network
d) overlay network

Answer: d
Explanation: An overlay network is a computer network that is built on top of another network. Some examples of an overlay network are Virtual Private Networks (VPN) and Peer-to-Peer Networks (P2P).

4. In computer network nodes are _____
a) the computer that originates the data
b) the computer that routes the data
c) the computer that terminates the data

d) all of the mentioned

Answer: d
Explanation: In a computer network, a node can be anything that is capable of sending data or receiving data or even routing the data to its destination. Routers, Computers and Smartphones are some examples of network nodes.

5. Communication channel is shared by all the machines on the network in _____
a) broadcast network
b) unicast network
c) multicast network
d) anycast network

Answer: a
Explanation: In a broadcast network, information is sent to all stations in a network whereas in a multicast network the data or information is sent to a group of stations in the network. In unicast network, information is sent to only one specific station. The broadcast address of the network is the last assigned address of the network.

6. Bluetooth is an example of _____
a) personal area network
b) local area network
c) virtual private network
d) wide area network

Answer: a
Explanation: Bluetooth is a wireless technology used to create a wireless personal area network for data transfer up to a distance of 10 meters. It operates on 2.45 GHz frequency band for transmission.

7. A _____ is a device that forwards packets between networks by processing the routing information included in the packet.
a) bridge
b) firewall
c) router
d) hub
Answer: c
Explanation: A router is a networking device that forwards data packets between computer networks. Routers perform the traffic directing functions on the Internet. They make use of routing protocols like RIP to find the cheapest path to the destination.

8. A list of protocols used by a system, one protocol per layer, is called _____
a) protocol architecture
b) protocol stack
c) protocol suite
d) protocol system
Answer: b
Explanation: A protocol stack refers to a group of protocols that are running concurrently that are employed for the implementation of network protocol suite.

Each layer in the network model has to use one specific protocol from the protocol stack.

9. Network congestion occurs _____
a) in case of traffic overloading
b) when a system terminates
c) when connection between two nodes terminates
d) in case of transfer failure
Answer: a
Explanation: Network congestion occurs when traffic in the network is more than the network could handle. To avoid network congestion, the network management uses various open-loop and closed-loop congestion control techniques.

10. Which of the following networks extends a private network across public networks?
a) local area network
b) virtual private network
c) enterprise private network
d) storage area network
Answer: b
Explanation: A virtual private network extends a private network across a public network, and enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network.VPN provides enhanced security and online anonymity to users on the internet. It is also used to unblock websites which are unavailable in certain regions.

SET-V PHYSICAL LAYER

1. The physical layer is concerned with _____
a) bit-by-bit delivery
b) process to process delivery
c) application to application delivery
d) port to port delivery

Answer: a
Explanation: Physical layer deals with bit to bit delivery in networking. The data unit in the physical layer is bits. Process to process delivery or the port to port delivery is dealt in the transport layer. The various transmission mediums aid the physical layer in performing its functions.

2. Which transmission media provides the highest transmission speed in a network?
a) coaxial cable
b) twisted pair cable
c) optical fiber
d) electrical cable

Answer: c
Explanation: Fiber optics is considered to have the highest transmission speed among the all mentioned above. The fiber optics transmission runs at 1000Mb/s. It is called as 1000Base-Lx whereas IEEE standard for it is 802.3z. It is popularly used for modern day network connections due to its high transmission rate.

3. Bits can be sent over guided and unguided media as analog signal by _____
a) digital modulation
b) amplitude modulation
c) frequency modulation
d) phase modulation

Answer: a
Explanation: In analog modulation, digital low frequency baseband signal (digital bit stream) is transmitted over a higher frequency. Whereas in digital modulation the only difference is that the base band signal is of discrete amplitude level. The bits are represented by only two frequency levels, one for high and one for low.

4. The portion of physical layer that interfaces with the media access control sublayer is called _____
a) physical signalling sublayer
b) physical data sublayer
c) physical address sublayer
d) physical transport sublayer

Answer: a
Explanation: The portion of physical layer that interfaces with the medium access control sublayer is Physical Signaling Sublayer. The main function of this layer is character encoding, reception, decoding and performs optional isolation functions. It handles which media connection the signal should be forwarded to physically.

5. The physical layer provides _____
a) mechanical specifications of electrical connectors and cables
b) electrical specification of transmission line signal level
c) specification for IR over optical fiber
d) all of the mentioned

Answer: d
Explanation: Anything dealing with a network cable or the standards in use – including pins, connectors and the electric current used is dealt in the physical layer (Layer 1). Physical layer deals with bit to bit delivery of the data aided by the various transmission mediums.

6. In asynchronous serial communication the physical layer provides _____
a) start and stop signalling
b) flow control
c) both start & stop signalling and flow control
d) only start signalling

Answer: c
Explanation: In asynchronous serial communication, the communication is not synchronized by clock signal. Instead of a start and stop signaling and flow control method is followed. Unlike asynchronous serial communication, in synchronous serial communication a clock signal is used for communication, so the start and stop method is not really required.

7. The physical layer is responsible for _____
a) line coding
b) channel coding
c) modulation
d) all of the mentioned

Answer: d
Explanation: The physical layer is responsible for line coding, channel coding and modulation that is needed for the transmission of the information. The physical configuration including pins, connectors and the electric current used is dealt in the physical layer based on the requirement of the network application.

8. The physical layer translates logical communication requests from the _____ into hardware specific operations.
a) data link layer
b) network layer
c) trasnport layer
d) application layer

Answer: a
Explanation: Physical layer accepts data or information from the data link layer and converts it into hardware specific operations so as to transfer the message through physical cables. Some examples of the cables used are optical fiber cables, twisted pair cables and co-axial cables.

9. A single channel is shared by multiple signals by _____
a) analog modulation

b) digital modulation
c) multiplexing
d) phase modulation

Answer: c
Explanation: In communication and computer networks, the main goal is to share a scarce resource. This is done by multiplexing, where multiple analog or digital signals are combined into one signal over a shared medium. The multiple kinds of signals are designated by the transport layer which is the layer present on a higher level than the physical layer.

10. Wireless transmission of signals can be done via _____
a) radio waves
b) microwaves
c) infrared
d) all of the mentioned

Answer: d
Explanation: Wireless transmission is carried out by radio waves, microwaves and IR waves. These waves range from 3 Khz to above 300 Ghz and are more suitable for wireless transmission. Radio waves can penetrate through walls and are used in radio communications, microwaves and infrared (IR) waves cannot penetrate through walls and are used for satellite communications and device communications respectively.

SET-VI DATA LINK LAYER

1. The data link layer takes the packets from _____ and encapsulates them into frames for transmission.
a) network layer
b) physical layer
c) transport layer
d) application layer

Answer: a
Explanation: In computer networks, the data from application layer is sent to transport layer and is converted to segments. These segments are then transferred to the network layer and these are called packets. These packets are then sent to data link layer where they are encapsulated into frames. These frames are then transferred to physical layer where the frames are converted to bits. Error control and flow control data is inserted in the frames at the data link layer.

2. Which of the following tasks is not done by data link layer?
a) framing
b) error control
c) flow control
d) channel coding

Answer: d
Explanation: Channel coding is the function of physical layer. Data link layer mainly deals with framing, error control and flow control. Data link layer is the layer where the packets are encapsulated into frames.

3. Which sublayer of the data link layer performs data link functions that depend upon the type of medium?
a) logical link control sublayer
b) media access control sublayer
c) network interface control sublayer
d) error control sublayer

Answer: b
Explanation: Media access control (MAC) deals with transmission of data packets to and from the network-interface card, and also to and from another remotely shared channel. The MAC sublayer also prevents collision using protocols like CSMA/CD.

4. Header of a frame generally contains _____
a) synchronization bytes
b) addresses
c) frame identifier
d) all of the mentioned

Answer: d
Explanation: In a frame, the header is a part of the data that contains all the required information about the transmission of the file. It contains information like synchronization bytes, addresses, frame identifier etc. It also contains error control information for reducing the errors in the transmitted frames.

5. Automatic repeat request error management mechanism is provided by _____
a) logical link control sublayer
b) media access control sublayer
c) network interface control sublayer
d) application access control sublayer

Answer: a
Explanation: The logical link control is a sublayer of data link layer whose main function is to manage traffic, flow and error control. The automatic repeat request error management mechanism is provided by the LLC when an error is found in the received frame at the receiver's end to inform the sender to re-send the frame.

6. When 2 or more bits in a data unit has been changed during the transmission, the error is called _____
a) random error
b) burst error
c) inverted error
d) double error

Answer: b
Explanation: When a single bit error occurs in a data, it is called single bit error. When more than a single bit of data is corrupted or has error, it is called burst error. If a single bit error occurs, the bit can be simply repaired by inverting it, but in case of a burst error, the sender has to send the frame again.

7. CRC stands for _____
a) cyclic redundancy check
b) code repeat check
c) code redundancy check
d) cyclic repeat check

Answer: a
Explanation: Cyclic redundancy check is a code that is added to a data which helps us to identify any error that occurred during the transmission of the data. CRC is only able to detect errors, not correct them. CRC is inserted in the frame trailer.

8. Which of the following is a data link protocol?
a) ethernet
b) point to point protocol
c) hdlc
d) all of the mentioned

Answer: d
Explanation: There are many data link layer protocols. Some of them are SDLC (synchronous data link protocol), HDLC (High level data link control), SLIP (serial line interface protocol), PPP (Point to point protocol) etc. These protocols are used to provide the logical link control function of the Data Link Layer.

9. Which of the following is the multiple access protocol for channel access control?
a) CSMA/CD
b) CSMA/CA
c) Both CSMA/CD & CSMA/CA

d) HDLC

Answer: c
Explanation: In CSMA/CD, it deals with detection of collision after collision has occurred, whereas CSMA/CA deals with preventing collision. CSMA/CD is abbreviation for Carrier Sensing Multiple Access/Collision detection. CSMA/CA is abbreviation for Carrier Sensing Multiple Access/Collision Avoidance. These protocols are used for efficient multiple channel access.

10. The technique of temporarily delaying outgoing acknowledgements so that they can be hooked onto the next outgoing data frame is called _____
a) piggybacking
b) cyclic redundancy check
c) fletcher's checksum
d) parity check

Answer: a
Explanation: Piggybacking is a technique in which the acknowledgment is temporarily delayed so as to be hooked with the next outgoing data frame. It saves a lot of channel bandwidth as in non-piggybacking system, some bandwidth is reserved for acknowledgement.

SET-VII NETWORK LAYER

1. The network layer is concerned with _____ of data.
a) bits
b) frames
c) packets
d) bytes

Answer: c
Explanation: In computer networks, the data from the application layer is sent to the transport layer and is converted to segments. These segments are then transferred to the network layer and these are called packets. These packets are then sent to data link layer where they are encapsulated into frames. These frames are then transferred to physical layer where the frames are converted to bits.

2. Which one of the following is not a function of network layer?
a) routing
b) inter-networking
c) congestion control
d) error control

Answer: d
Explanation: In the OSI model, network layer is the third layer and it provides data routing paths for network communications. Error control is a function of the data link layer and the transport layer.

3. A 4 byte IP address consists of _____
a) only network address
b) only host address
c) network address & host address
d) network address & MAC address

Answer: c
Explanation: An ip address which is 32 bits long, that means it is of 4 bytes and is composed of a network and host portion and it depends on address class. The size of the host address and network address depends upon the class of the address in classful IP addressing.

4. In virtual circuit network each packet contains _____
a) full source and destination address
b) a short VC number
c) only source address
d) only destination address

Answer: b
Explanation: A short VC number also called as VCID (virtual circuit identifier) is a type of identifier which is used to distinguish between several virtual circuits in a connection oriented circuit switched network. Each virtual circuit is used to transfer data over a larger packet switched network.

5. Which of the following routing algorithms can be used for network layer design?
a) shortest path algorithm
b) distance vector routing

c) link state routing
d) all of the mentioned

Answer: d
Explanation: The routing algorithm is what decides where a packet should go next. There are several routing techniques like shortest path algorithm, static and dynamic routing, decentralized routing, distance vector routing, link state routing, Hierarchical routing etc. The routing algorithms go hand in hand with the operations of all the routers in the networks. The routers are the main participants in these algorithms.

6. Which of the following is not correct in relation to multi-destination routing?
a) is same as broadcast routing
b) contains the list of all destinations
c) data is not sent by packets
d) there are multiple receivers

Answer: c
Explanation: In multi-destination routing, there is more than one receiver and the route for each destination which is contained in a list of destinations is to be found by the routing algorithm. Multi-destination routing is also used in broadcasting.

7. A subset of a network that includes all the routers but contains no loops is called _____
a) spanning tree
b) spider structure
c) spider tree
d) special tree

Answer: a
Explanation: Spanning tree protocol (STP) is a network protocol that creates a loop free logical topology for ethernet networks. It is a layer 2 protocol that runs on bridges and switches. The main purpose of STP is to ensure that you do not create loops when you have redundant paths in your network.

8. Which one of the following algorithm is not used for congestion control?
a) traffic aware routing
b) admission control
c) load shedding
d) routing information protocol

Answer: d
Explanation: The Routing Information Protocol (RIP) is used by the network layer for the function of dynamic routing. Congestion control focuses on the flow of the traffic in the network and uses algorithms like traffic aware routing, admission control and load shedding to deal with congestion.

9. The network layer protocol for internet is _____
a) ethernet
b) internet protocol
c) hypertext transfer protocol
d) file transfer protocol

Answer: b
Explanation: There are several protocols used in Network layer. Some of them are IP,

ICMP, CLNP, ARP, IPX, HRSP etc. Hypertext transfer protocol is for application layer and ethernet protocol is for data link layer.

10. ICMP is primarily used for _____
a) error and diagnostic functions
b) addressing
c) forwarding
d) routing
Answer: a
Explanation: ICMP abbreviation for Internet Control Message Protocol is used by networking devices to send error messages and operational information indicating a host or router cannot be reached. ICMP operates over the IP packet to provide error reporting functionality as IP by itself cannot report errors.

SET-VIII TRASNSPORT LAYER

1. Transport layer aggregates data from different applications into a single stream before passing it to _____
a) network layer
b) data link layer
c) application layer
d) physical layer

Answer: a
Explanation: The flow of data in the OSI model flows in following manner Application -> Presentation -> Session -> Transport -> Network -> Data Link -> Physical. Each and every layer has its own set of functions and protocols to ensure efficient network performance.

2. Which of the following are transport layer protocols used in networking?
a) TCP and FTP
b) UDP and HTTP
c) TCP and UDP
d) HTTP and FTP

Answer: c
Explanation: Both TCP and UDP are transport layer protocol in networking. TCP is an abbreviation for Transmission Control Protocol and UDP is an abbreviation for User Datagram Protocol. TCP is connection oriented whereas UDP is connectionless.

3. User datagram protocol is called connectionless because _____
a) all UDP packets are treated independently by transport layer
b) it sends data as a stream of related packets
c) it is received in the same order as sent order
d) it sends data very quickly

Answer: a
Explanation: UDP is an alternative for TCP and it is used for those purposes where speed matters most whereas loss of data is not a problem. UDP is connectionless whereas TCP is connection oriented.

4. Transmission control protocol _____
a) is a connection-oriented protocol
b) uses a three way handshake to establish a connection
c) receives data from application as a single stream
d) all of the mentioned

Answer: d
Explanation: TCP provides reliable and ordered delivery of a stream of bytes between hosts communicating via an IP network. Major internet applications like www, email, file transfer etc rely on TCP. TCP is connection oriented and it is optimized for accurate delivery rather than timely delivery.

5. An endpoint of an inter-process communication flow across a computer network is called _____
a) socket
b) pipe
c) port
d) machine

Answer: a
Explanation: Socket is one end point in a two way communication link in the network. TCP layer can identify the application that data is destined to be sent by using the port number that is bound to socket.

6. Socket-style API for windows is called _____
a) wsock
b) winsock
c) wins
d) sockwi

Answer: b
Explanation: Winsock is a programming interface which deals with input output requests for internet applications in windows OS. It defines how windows network software should access network services.

7. Which one of the following is a version of UDP with congestion control?
a) datagram congestion control protocol
b) stream control transmission protocol
c) structured stream transport
d) user congestion control protocol

Answer: a
Explanation: The datagram congestion control is a transport layer protocol which deals with reliable connection setup, teardown, congestion control, explicit congestion notification, and feature negotiation. It is used in modern day systems where there are really high chances of congestion. The protocol was last updated in the year 2008.

8. A _____ is a TCP name for a transport service access point.
a) port
b) pipe
c) node
d) protocol

Answer: a
Explanation: Just as the IP address identifies the computer, the network port identifies the application or service running on the computer. A port number is 16 bits. The combination of IP address preceded with the port number is called the socket address.

9. Transport layer protocols deals with _____
a) application to application communication
b) process to process communication
c) node to node communication

d) man to man communication

Answer: b
Explanation: Transport layer is 4th layer in TCP/IP model and OSI reference model. It deals with logical communication between process. It is responsible for delivering a message between network host.

10. Which of the following is a transport layer protocol?
a) stream control transmission protocol
b) internet control message protocol
c) neighbor discovery protocol
d) dynamic host configuration protocol

Answer: a
Explanation: The Stream Control Transmission Protocol (SCTP) is a transport layer protocol used in networking system where streams of data are to be continuously transmitted between two connected network nodes. Some of the other transport layer protocols are RDP, RUDP, TCP, DCCP, UDP etc.

SET-IX SECURITY & PHYSICAL LAYER

1. Which network topology requires a central controller or hub?
a) Star
b) Mesh
c) Ring
d) Bus

Answer: a
Explanation: In star topology, no computer is connected to another computer directly but all the computers are connected to a central hub. Every message sent from a source computer goes through the hub and the hub then forwards the message only to the intended destination computer.

2. _____ topology requires a multipoint connection.
a) Star
b) Mesh
c) Ring
d) Bus

Answer: d
Explanation: In bus topology, there is a single cable to which all the network nodes are connected. So whenever a node tries to send a message or data to other nodes, this data passes through all other nodes in the network through the cable. It is really simple to install but it’s not secure enough to be used in most of the computer network applications.

3. WAN stands for _____
a) World area network
b) Wide area network
c) Web area network
d) Web access network

Answer: b
Explanation: WAN is the abbreviation for Wide Area Network. This network extends over a large geographical area. These are used to connect cities, states or even countries. They can be connected through leased lines or satellites.

4. Multiplexing is used in _____
a) Packet switching
b) Circuit switching
c) Data switching
d) Packet & Circuit switching

Answer: b
Explanation: Circuit switching is a switching method by which one can obtain a physical path between end points. Circuit switching method is also called a connection oriented network. Two nodes must be physically and logically connected to each other to create a circuit switching network.

5. Which multiplexing technique used to transmit digital signals?
a) FDM

b) TDM
c) WDM
d) FDM & WDM

Answer: b
Explanation: TDM abbreviation for Time Division Multiplexing is a method used for digital signals. Whereas FDM and WDM abbreviation for Frequency Division Multiplexing, and Wavelength Division Multiplexing, are used for analog signals. TDM is used in applications like ISDN (Integrated Services Digital Network) and PSTN (Public Switched Telephone Network).

6. If there are n signal sources of same data rate, then the TDM link has _____ slots.
a) n
b) n/2
c) n*2
d) 2^n

Answer: a
Explanation: In TDM, the total unit of time is divided equally among all the signal sources and each and every source has access to the complete channel bandwidth during its allotted time slot. When the time slot of the source is not active, it remains idle and waits for its slot to begin.

7. If link transmits 4000frames per second, and each slot has 8 bits, the transmission rate of circuit this TDM is _____
a) 32kbps
b) 500bps
c) 500kbps
d) 32bps

Answer: a
Explanation: Transmission rate= frame rate * number of bits in a slot.
Given: Frame rate = 4000/sec and number of bits in slot = 8
Thus, Transmission rate = (4000 * 8) bps
= 32000bps
= 32kbps

8. For a 10Mbps Ethernet link, if the length of the packet is 32bits, the transmission delay is _____ (in microseconds)
a) 3.2
b) 32
c) 0.32
d) 320

Answer: a
Explanation: Transmission rate = length / transmission rate = 32/10 = 3.2 microseconds.

9. In the transfer of file between server and client, if the transmission rates along the path is 10Mbps, 20Mbps, 30Mbps, 40Mbps. The throughput is usually _____
a) 20Mbps

b) 10Mbps
c) 40Mbps
d) 50Mbps

Answer: b
Explanation: The throughput is generally the transmission rate of bottleneck link.

10. In a network, If P is the only packet being transmitted and there was no earlier transmission, which of the following delays could be zero?
a) Propagation delay
b) Queuing delay
c) Transmission delay
d) Processing delay

Answer: b
Explanation: Since there is no other packet to be transmitted, there is no need for a queue. Therefore, the delay caused due to the queuing would be none i.e. 0.

11. Transmission delay does not depend on _____
a) Packet length
b) Distance between the routers
c) Transmission rate
d) Bandwidth of medium

Answer: b
Explanation: Transmission delay = packet length / transmission rate. The transmission rate depends upon the bandwidth of the medium.

12. Propagation delay depends on _____
a) Packet length
b) Transmission rate
c) Distance between the routers
d) Speed of the CPU

Answer: c
Explanation: Propagation delay is caused when the packet is in its electric signal form and is travelling through a medium (a wire or a electromagnetic wave). Propagation delay is the time it takes a bit to propagate from one router to the next. If the distance between the routers is increased, it will take longer time to propagate, that is, there would be more propagation delay.

13. With respect to physical media, STP cables stands for _____
a) Shielded Twisted Pair Cable
b) Spanning Tree Protocol Cable
c) Static Transport Protocol Cable
d) Shielded Two Power Cable

Answer: a
Explanation: For physical media, STP cable stands for Shielded twisted pair cable. 100 Mbps is the max data capacity of STP cable and its default connector is RJ45. It is popularly used in LANs due to its ease of maintenance and installation.

14. What is the max length of the Shielded twisted pair cable?
a) 100 ft
b) 200 ft
c) 100 m
d) 200 m

Answer: c
Explanation: The max the Shielded twisted pair cable is 100 meters. If the length exceeds 100 meters, the loss of signals flowing through the cable would be really high. Thus, STP cable is more suitable for smaller networks like LANs.

15. What is the max data transfer rate of STP cables?
a) 10 Mbps
b) 100 Mbps
c) 1000 Mbps
d) 10000 Mbps

Answer: b
Explanation: 100 Mbps is the max data transfer rate that can be handled by STP cables, and its default connector is RJ-45. 100 Mbps is a feasible data transfer rate for small networks like LANs.

16. What is the central device in star topology?
a) STP server
b) Hub/switch
c) PDC
d) Router

Answer: b
Explanation: In star topology, no computer is connected to another computer directly but all the computers are connected to a central switch or hub. Every message sent from a source computer goes through the switch or hub and the switch or hub then forwards the message only to the intended destination computer.

17. What is the max data transfer rate for optical fiber cable?
a) 10 Mbps
b) 100 Mbps
c) 1000 Mbps
d) 10000 Mbps

Answer: d
Explanation: Fiber channel speeds have been increasing over the years. 10000 Mbps is the max data transfer rate for optical fiber cables. It is said to be the fastest among the other kinds of cables like STP cables and co-axial cables. People are now using optical fiber cables instead of STP cables for LANs due to their fast data transfer capability.

18. Firewalls are often configured to block _____
a) UDP traffic
b) TCP traffic
c) Sensitive traffic

d) Best-effort traffic

Answer: a
Explanation: UDP is more vulnerable to attacks, so firewalls are often configured to block suspicious UDP traffic.

19. Which of the following is a form of DoS attack?
a) Vulnerability attack
b) Bandwidth flooding
c) Connection flooding
d) All of the mentioned

Answer: d
Explanation: In a DoS attack, the attacker won't let the victims access the network by using a certain method that ensures that an essential network resource is unavailable to the victim. In vulnerability attack, the attacker exploits any obvious vulnerable entity in the network to deny the victim access into the network. In bandwidth flooding, the attacker floods the victim with a huge flow of packets and uses up all the bandwidth. In connection flooding, the attacker floods the victim network with a huge number of connections, so that, no other machine can connect to it.

20. Packet sniffers involve _____
a) Active receiver
b) Passive receiver
c) Legal receiver
d) Partially-active receiver

Answer: b
Explanation: The function of packet sniffers is to just silently receive the packets flowing in the channel. If they inject any packets into the channel, they might alert the other users about the intrusion.

21. UTP is commonly used in _____
a) DSL
b) FTTP
c) HTTP
d) None of the mentioned

Answer: a
Explanation: Unshielded twisted pair(UTP) is commonly used in home access.

22. Geostationary satellites _____
a) Are placed at a fixed point above the earth
b) Rotate the earth about a fixed axis
c) Rotate the earth about a varying axis
d) All of the mentioned

Answer: a
Explanation: They are placed in orbit at 36,000km above Earth's surface.

23. A local telephone network is an example of a _____ network.
a) Packet switched
b) Circuit switched
c) Bit switched
d) Line switched
Answer: b
Explanation: Circuit switching is connection oriented switching technique, whereas in the case of packet switching, it is connectionless. Circuit switching is implemented in the Physical layer, whereas packet switching is implemented in the Network layer. Internet too is based on the concept of circuit switching.

24. Which of the following is not an application layer service?
a) Network virtual terminal
b) File transfer, access, and management
c) Mail service
d) Error control

Answer: d
Explanation: Application layer is the topmost layer in the OSI model. Network virtual terminal, mail service, file transfer, access and management are all services of the application layer. It uses protocols like HTTP, FTP, and DNS etc. to provide these services.

SET-X APPLICATION LAYER

1. Which is not a application layer protocol?
a) HTTP
b) SMTP
c) FTP
d) TCP

Answer: d
Explanation: TCP is transport layer protocol.

2. The packet of information at the application layer is called _____
a) Packet
b) Message
c) Segment
d) Frame

Answer: b
Explanation: For Application, Presentation and Session layers there is no data format for message. Message is message as such in these three layers. But when it comes to Transport, Network, Data and Physical layer they have data in format of segments, packets, frames and bits respectively.

3. Application layer offers _____ service.
a) End to end
b) Process to process
c) Both End to end and Process to process
d) None of the mentioned

Answer: a
Explanation: End to End service is provided in the application layer. Whereas process to process service is provided at the transport layer.

4. To deliver a message to the correct application program running on a host, the _____ address must be consulted.
a) IP
b) MAC
c) Port
d) None of the mentioned

Answer: c
Explanation: IP address lets you know where the network is located. Whereas MAC address is a unique address for every device. Port address identifies a process or service you want to carry on.

5. Electronic mail uses which Application layer protocol?
a) SMTP
b) HTTP
c) FTP
d) SIP

Answer: a
Explanation: Email uses various protocols like SMTP, IMAP and POP. The most prominent one used in application layer is SMTP.

6. The ASCII encoding of binary data is called
a) base 64 encoding
b) base 32 encoding
c) base 16 encoding
d) base 8 encoding

Answer: a
Explanation: Base64 is used commonly in a number of applications including email via MIME, and storing complex data in XML. Problem with sending normal binary data to a network is that bits can be misinterpreted by underlying protocols, produce incorrect data at receiving node and that is why we use this code.

7. Which one of the following is not correct?
a) Application layer protocols are used by both source and destination devices during a communication session
b) HTTP is a session layer protocol
c) TCP is an application layer protocol
d) All of the mentioned

Answer: d
Explanation: HTTP is an application layer protocol. Whereas TCP is a transport layer protocol.

8. Which one of the following is not correct?
a) Application layer protocols are used by both source and destination devices during a communication session
b) HTTP is a session layer protocol
c) TCP is an application layer protocol
d) All of the mentioned

Answer: d
Explanation: HTTP is an application layer protocol. Whereas TCP is a transport layer protocol.

9. Expansion of FTP is _____
a) Fine Transfer Protocol
b) File Transfer Protocol
c) First Transfer Protocol
d) Fast Transfer Protocol

Answer: b
Explanation: File Transfer Protocol is an application layer protocol used to share “files” between a server and a client. The protocol uses two separate ports for data and control connections: port 20 for data and port 21 for control.

10. Expansion of FTP is _____
a) Fine Transfer Protocol
b) File Transfer Protocol

c) First Transfer Protocol
d) Fast Transfer Protocol

Answer: b
Explanation: File Transfer Protocol is an application layer protocol used to share “files” between a server and a client. The protocol uses two separate ports for data and control connections: port 20 for data and port 21 for control.

11. If 5 files are transferred from server A to client B in the same session. The number of TCP connections between A and B is _____
a) 5
b) 10
c) 2
d) 6

Answer: d
Explanation: The client would first initiate the TCP control connection through port 21. Then for every file transfer, a separate connection would be made through port 20. Now, since we have five files to be transferred, 1 control connection + 5 data connections = 6 total TCP connections.

12. The password is sent to the server using _____ command.
a) PASSWD
b) PASS
c) PASSWORD
d) PWORD

Answer: b
Explanation: The PASS command, preceded by the username, completes the user’s identification for access control in an FTP session. Without the valid password, the user won’t be able to initiate the FTP connection.

13. SSH uses _____ to authenticate the remote computer.
a) public-key cryptography
b) private-key cryptography
c) any of public-key or private-key
d) both public-key & private-key

Answer: a
Explanation: Public encryption key is slower but more flexible. Every cryptographic security system requires a private key for private access and a public key for location.

14. Which standard TCP port is assigned for contacting SSH servers?
a) port 21
b) port 22
c) port 23
d) port 24

Answer: b
Explanation: Port 22 is used for contacting ssh servers, used for file transfers (scp, sftp) and also port forwarding.

15. Which one of the following protocol can be used for login to a shell on a remote host except SSH?
a) telnet
b) rlogin
c) both telnet and rlogin
d) none of the mentioned

Answer: c
Explanation: SSH is more secured then telnet and rlogin.

16. The entire hostname has a maximum of _____
a) 255 characters
b) 127 characters
c) 63 characters
d) 31 characters

Answer: a
Explanation: An entire hostname can have a maximum of 255 characters. Although each label must be from 1 to 63 characters long. Host name is actually a label that is given to a device in a network.

17. DNS database contains _____
a) name server records
b) hostname-to-address records
c) hostname aliases
d) all of the mentioned

Answer: d
Explanation: Domain Name system not only deals with mapping IP addresses with the hostname but also deals with exchange of information in the server.

18. Wildcard domain names start with label _____
a) @
b) *
c) &
d) #

Answer: b
Explanation: A wildcard DNS record matches requests to a non existent domain name. This wildcard DNS record is specified by using asterisk “*” as the starting of a domain name.

19. IPSec is designed to provide security at the _____
a) Transport layer
b) Network layer
c) Application layer
d) Session layer

Answer: b
Explanation: IPSec is a set of protocols used to provide authentication, data integrity and confidentiality between two machines in an IP network. In the TCP/IP model, it provides security at the IP layer i.e. the network layer.

20. WPA2 is used for security in _____
a) Ethernet
b) Bluetooth
c) Wi-Fi
d) Email

Answer: c
Explanation: WPA2 or WiFi Protected Access 2 is a security protocol used to provide users and firms with strong data security and protection for their wireless networks (WiFi) to give them confidence that only authorized users can access their network.

21. An attempt to make a computer resource unavailable to its intended users is called _____
a) Denial-of-service attack
b) Virus attack
c) Worms attack
d) Botnet process

Answer: a
Explanation: In a Denial of Service attack, the attacker won't let the victims access the network by using a certain method that ensures that an essential network resource is unavailable to the victim. The methods that the attacker can use are vulnerability attack, bandwidth flooding and connection flooding.

22. Pretty good privacy (PGP) is used in _____
a) Browser security
b) Email security
c) FTP security
d) WiFi security

Answer: b
Explanation: PGP is an encryption method used in e-mail security to encrypt and decrypt the content of an e-mail transmitted over the internet. It makes sure that the message cannot be stolen by other unauthorized users.

23. When a DNS server accepts and uses incorrect information from a host that has no authority giving that information, then it is called _____
a) DNS lookup
b) DNS hijacking
c) DNS spoofing
d) DNS authorizing

Answer: c
Explanation: In DNS spoofing, also known as DNS cache poisoning, an attacker gets the valid credentials from a victim by spoofing the intended resource, and tricking the victim to give his/her valid authorization credentials.

24. _____ allows you to connect and login to a remote computer
a) Telnet
b) FTP
c) HTTP

d) SMTP

Answer: a
Explanation: Telnet provides access to the command-line interface on a remote computer. One can login to the computer from the command-line interface.

25. DHCP client and servers on the same subnet communicate via _____
a) UDP broadcast
b) UDP unicast
c) TCP broadcast
d) TCP unicast

Answer: a
Explanation: DHCP actually employs a connectionless service, which is provided by UDP, since TCP is connection oriented. It is implemented with two UDP port numbers 67 and 68 for its operations.

26. DHCP (dynamic host configuration protocol) provides _____ to the client.
a) IP address
b) MAC address
c) Url
d) None of the mentioned

Answer: a
Explanation: We use DHCP to allow the hosts to acquire their ip addresses dynamically which is better than visiting each and every host on the network and configure all of this information manually.

27. Telnet protocol is used to establish a connection to _____
a) TCP port number 21
b) TCP port number 22
c) TCP port number 23
d) TCP port number 25

Answer: c
Explanation: TCP port 21 is used for FTP, TCP port 22 is used for SSH and TCP port 25 is used for SMTP. Telnet provides access to a command line interface on a remote computer using the TCP port number 23.

SET-XI TRANSPORT LAYER

1. TCP process may not write and read data at the same speed. So we need _____ for storage.
a) Packets
b) Buffers
c) Segments
d) Stacks

Answer: b
Explanation: A TCP receiver has a receive buffer that is used to store the unprocessed incoming packets in case the sender is sending packets faster than the processing rate of the received packets.

2. Communication offered by TCP is _____
a) Full-duplex
b) Half-duplex
c) Semi-duplex
d) Byte by byte

Answer: a
Explanation: Data can flow both the directions at the same time during a TCP communication hence, it is full-duplex. This is the reason why TCP is used in systems that require full-duplex operation such as e-mail systems.

3. What is the header size of a UDP packet?
a) 8 bytes
b) 8 bits
c) 16 bytes
d) 124 bytes

Answer: a
Explanation: The fixed size of the UDP packet header is 8 bytes. It contains four two-byte fields: Source port address, Destination port address, Length of packet, and checksum.

4. Which of the following is false with respect to UDP?
a) Connection-oriented
b) Unreliable
c) Transport layer protocol
d) Low overhead

Answer: a
Explanation: UDP is an unreliable, connectionless transport layer protocol that provides message-based data transmission. TCP is an example of connection-oriented protocols.

5. Which two types of encryption protocols can be used to secure the authentication of computers using IPsec?
a) Kerberos V5
b) SHA
c) MD5
d) Both SHA and MD5

Answer: d
Explanation: SHA or MD5 can be used. Kerberos V5 is an authentication protocol, not an encryption protocol; therefore, answer A is incorrect. Certificates are a type of authentication that can be used with IPsec, not an encryption protocol; therefore, answer B is incorrect.

6. IP Security operates in which layer of the OSI model?
a) Network
b) Transport
c) Application
d) Physical

Answer: a
Explanation: IPSec is a set of protocols used to provide authentication, data integrity and confidentiality between two machines in an IP network. In the TCP/IP model, it provides security at the IP layer i.e. the network layer.

SET-XII TCP/IP PROTOCOL

1. A piece of icon or image on a web page associated with another webpage is called _____
a) url
b) hyperlink
c) plugin
d) extension

Answer: b
Explanation: URLs are locators for resources present on the World Wide Web. A plugin provides extra functionality to the webpage. An extension provides modification allowance for the core functionality of a webpage. Hyperlink is piece of icon or image on a web page associated with another webpage.

2. Common gateway interface is used to _____
a) generate executable files from web content by web server
b) generate web pages
c) stream videos
d) download media files

Answer: a
Explanation: CGI is an interface through servers can run execute console-based executable files on a web server that generates dynamic web pages. A CGI script executes only when a request is made. The script then generates HTML.

3. URL stands for _____
a) unique reference label
b) uniform reference label
c) uniform resource locator
d) unique resource locator

Answer: c
Explanation: The Uniform Resource Locator is a locator for the resource to be located by HTTP on the World Wide Web. The URL is derived from the Uniform Resource Identifier.

4. AJAX stands for _____
a) asynchronous javascript and xml
b) advanced JSP and xml
c) asynchronous JSP and xml
d) advanced javascript and xml

Answer: a
Explanation: AJAX is a group of technologies that works on the client-side to create asynchronous web applications. It is used to modify only a part of a webpage and not the whole webpage whenever some event occurs.

5. Which of the following field in IPv4 datagram is not related to fragmentation?
a) Flags
b) Offset
c) TOS

d) Identifier

Answer: c
Explanation: TOS-type of service identifies the type of packets. It is not related to fragmentation but is used to request specific treatment such as high throughput, high reliability or low latency for the IP packet depending upon the type of service it belongs to.

6. The TTL field has value 10. How many routers (max) can process this datagram?
a) 11
b) 5
c) 10
d) 1

Answer: c
Explanation: TTL stands for Time to Live. This field specifies the life of the IP packet based on the number of hops it makes (Number of routers it goes through). TTL field is decremented by one each time the datagram is processed by a router. When the value is 0, the packet is automatically destroyed.

7. What should be the flag value to indicate the last fragment?
a) 0
b) 1
c) TTl value
d) Protocol field value

Answer: a
Explanation: The Flag field in the IP header is used to control and identify the fragments. It contains three bits: reserved, don't fragment and more fragments. If the more fragments bit is 0, it means that the fragment is the last fragment.

8. Dual-stack approach refers to _____
a) Implementing Ipv4 with 2 stacks
b) Implementing Ipv6 with 2 stacks
c) Node has both IPv4 and IPv6 support
d) Implementing a MAC address with 2 stacks

Answer: c
Explanation: Dual-stack is one of the approaches used to support IPv6 in already existing systems. ISPs are using it as a method to transfer from IPv4 to IPv6 completely eventually due to the lower number of possible available addresses in IPv4.

9. Suppose two IPv6 nodes want to interoperate using IPv6 datagrams, but they are connected to each other by intervening IPv4 routers. The best solution here is _____
a) Use dual-stack approach
b) Tunneling
c) No solution
d) Replace the system

Answer: b
Explanation: The IPv4 routers can form a tunnel in which at the sender's side, the IPv6 datagram is encapsulated in to IPv4, and at the receiver's side of the tunnel, the IPv4 packet is stripped and the IPv6 packet is sent to the receiver.

10. Internet Control Message Protocol (ICMP) has been designed to compensate _____
a) Error-reporting
b) Error-correction
c) Host and management queries
d) All of the mentioned

Answer: d
Explanation: IP by itself does not provide the features of error reporting or error correction. So, to address these issues a network layer protocol called Internet Control Message Protocol is used. ICMP operates over the IP packet to provide error reporting functionality.

11. Header size of the ICMP message is _____
a) 8-bytes
b) 8-bits
c) 16-bytes
d) 16-bits

Answer: a
Explanation: An ICMP message has an 8-byte header and a variable size data section. Out of the 8 bytes, the first 4 bytes are of a fixed format having the type, code and checksum fields and the next 4 bytes depend upon the type of the message.

12. ICMP error message will not be generated for a datagram having a special address such as _____
a) 127.0.0.0
b) 12.1.2
c) 11.1
d) 127

Answer: a
Explanation: 127.0.0.0 is a special address known as the loopback address which is used for testing purpose of a machine without actually communicating with a network. Thus no error reporting message will be generated for such special addresses.

13. In a simple echo-request message, the value of the sum is 01010000 01011100. Then, value of checksum is _____
a) 10101111 10100011
b) 01010000 01011100
c) 10101111 01011100
d) 01010000 10100011

Answer: a
Explanation: The sender side adds the bits of the fragmented packet to find a sum.

Checksum is the compliment of the sum (exchange 0’s and 1’s). The receiver then has to verify the checksum by adding the bits of the received packet to ensure that the packet is error-free.

SET-XIII NETWORK

1. Which type of Ethernet framing is used for TCP/IP and DEC net?
a) Ethernet 802.3
b) Ethernet 802.2
c) Ethernet II
d) Ethernet SNAP

Answer: c
Explanation: The Ethernet 802.3 framing is used for NetWare versions 2 to 3.11, and the Ethernet 802.2 framing is used for NetWare versions 3.12 and later plus OSI routing, Ethernet II is used with TCP/IP and DEC net, and Ethernet SNAP is used with TCP/IP and AppleTalk. The type field in Ethernet 802.2 frame is replaced by a length field in Ethernet 802.3.

2. In asymmetric key cryptography, the private key is kept by _____
a) sender
b) receiver
c) sender and receiver
d) all the connected devices to the network

Answer: b
Explanation: The private key is kept only by the receiver of the message. Its aim is to make sure that only the intended receiver can decipher the message.

3. What is data encryption standard (DES)?
a) block cipher
b) stream cipher
c) bit cipher
d) byte cipher

Answer: a
Explanation: DES is a symmetric key block cipher in which the block size is 64 bits and the key size is 64 bits. It is vulnerable to some attacks and is hence not that popularly used.

4. In the network HTTP resources are located by _____
a) Uniform resource identifier
b) Unique resource locator
c) Unique resource identifier
d) Union resource locator

Answer: a
Explanation: The Uniform Resource Identifier is a name and locator for the resource to be located by the HTTP. The URLs and URNs are derived through the identifier.

5. The File Transfer Protocol is built on _____
a) data centric architecture
b) service oriented architecture
c) client server architecture
d) connection oriented architecture

Answer: c
Explanation: The FTP connection includes a Server and a Client which wish to share files. The server can have multiple clients at the same time while the client communicates with only one server at a time.

6. Which attribute is used to extend the lifetime of a cookie?
a) Higher-age
b) Increase-age
c) Max-age
d) Lifetime

Answer: c
Explanation: If you want a cookie to last beyond a single browsing session, you must tell the browser how long (in seconds) you would like it to retain the cookie by specifying a max-age attribute. A number of seconds until the cookie expires. A zero or negative number will kill the cookie immediately.

7. How can you set a Cookie visibility scope to local Storage?
a) /
b) %
c) *
d) #

Answer: a
Explanation: Setting the path of a cookie to "/" gives scoping like that of localStorage and also specifies that the browser must transmit the cookie name and value to the server whenever it requests any web page on the site.

8. Open Shortest Path First (OSPF) is also called as _____
a) Link state protocol
b) Error-correction protocol
c) Routing information protocol
d) Border gateway protocol

Answer: a
Explanation: In OSPF, the link state of each path is checked, and then the shortest path is chosen among only the open state links. Each OSPF router monitors the cost of the link to each of its neighbors and then floods the link state information to other routers in the network.

9. The computation of the shortest path in OSPF is usually done by _____
a) Bellman-ford algorithm
b) Routing information protocol
c) Dijkstra's algorithm
d) Distance vector routing

Answer: c
Explanation: Shortest path in OSPF is usually computed by Dijkstra's algorithm. It was proposed by Edsger W. Dijkstra in the year 1956. It is a greedy method algorithm and hence may not guarantee the shortest path every time, but is really fast.

10. During datagram switching, the packets are placed in _____ to wait until the given transmission line becomes available.
a) Stack
b) Queue
c) Hash
d) Routing table

Answer: b
Explanation: When there are too many packets to be transmitted and the transmission line gets blocked while transmitting some packets, the remaining packets are stored in queue during delay and are served as first in first out. The delay is called as queuing delay.

11. Network layer firewall works as a _____
a) Frame filter
b) Packet filter
c) Content filter
d) Virus filter

Answer: b
Explanation: As you know, firewalls are available as hardware appliances, as software-only, or a combination of the two. In every case, the purpose of a firewall is to isolate your trusted internal network (or your personal PC) from the dangers of unknown resources on the Internet and other network connections that may be harmful. The firewall prevents unauthorized access to your internal, trusted network from outside threats.

12. A firewall is installed at the point where the secure internal network and untrusted external network meet which is also known as _____
a) Chock point
b) Meeting point
c) Firewall point
d) Secure point

Answer: a
Explanation: A firewall can be a PC, a router, a midrange, a mainframe, a UNIX workstation, or a combination of these that determines which information or services can be accessed from the outside and who is permitted to use the information and services from outside. Generally, a firewall is installed at the point where the secure internal network and untrusted external network meet, which is also known as a chokepoint.

13. The physical connection between an end point and a switch or between two switches is _____
a) Transmission path
b) Virtual path
c) Virtual circuit
d) Transmission circuit

Answer: a
Explanation: The physical connection between an end point and a switch or between

two switches is transmission path. The transmission path is the physical roadway that the packet needs to propagate in order to travel through the network.

14. MIB is a collection of groups of objects that can be managed by _____
a) SMTP
b) UDP
c) SNMP
d) TCP/IP

Answer: c
Explanation: MIB stands for Management Information Base. Simple network management controls the group of objects in management information base. It is usually used with SNMP (Simple Network Management Protocol).

SET-XIV WIRELESS LAN, POINT TO POINT PROTOCOL, ERROR DETECTION

1. Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?
a) CDMA
b) CSMA/CA
c) ALOHA
d) CSMA/CD

Answer: b
Explanation: CSMA/CA stands for Carrier-sense multiple access/collision avoidance. It is a multiple access protocol used by IEEE 802.11 standard for wireless LAN. It's based on the principle of collision avoidance by using different algorithms to avoid collisions between channels.

2. Mostly _____ is used in wireless LAN.
a) time division multiplexing
b) orthogonal frequency division multiplexing
c) space division multiplexing
d) channel division multiplexing

Answer: b
Explanation: In orthogonal frequency division multiplexing, digital data is encoded on multiple carrier frequencies. It is also used in digital television and audio broadcasting in addition to Wireless LANs.

3. What is WPA?
a) wi-fi protected access
b) wired protected access
c) wired process access
d) wi-fi process access

Answer: a
Explanation: WPA or WiFi Protected Access is a security protocol used to provide users and firms with strong data security and protection for their wireless networks (WiFi) to give them confidence that only authorized users can access their network.

4. Which of the following protocols is used in the internet?
a) HTTP
b) DHCP
c) DNS
d) DNS, HTTP and DNS

Answer: d
Explanation: HTTP is used to browse all the websites on the World Wide Web, DHCP is used to allot IPs automatically to the users on the internet, and DNS is used to connect the users to the host servers on the internet based on the Domain Name.

5. The size of an IP address in IPv6 is _____
a) 32 bits
b) 64 bits
c) 128 bits

d) 265 bits

Answer: c
Explanation: An IPv6 address is 128 bits long. Therefore, 2128 i.e. 340 undecillion addresses are possible in IPv6. IPv4 has only 4 billion possible addresses and IPv6 would be a brilliant alternative in case IPv4 runs out of possible new addresses.

6. The size of an IP address in IPv6 is _____
a) 32 bits
b) 64 bits
c) 128 bits
d) 265 bits

Answer: c
Explanation: An IPv6 address is 128 bits long. Therefore, 2128 i.e. 340 undecillion addresses are possible in IPv6. IPv4 has only 4 billion possible addresses and IPv6 would be a brilliant alternative in case IPv4 runs out of possible new addresses.

7. Bluetooth uses _____
a) frequency hopping spread spectrum
b) orthogonal frequency division multiplexing
c) time division multiplexing
d) channel division multiplexing

Answer: a
Explanation: Frequency hopping spread spectrum is a method of transmitting radio signals by rapidly changing the carrier frequency and is controlled by the codes known to the sender and receiver only.

8. Bluetooth transceiver devices operate in _____ band.
a) 2.4 GHz ISM
b) 2.5 GHz ISM
c) 2.6 GHz ISM
d) 2.7 GHz ISM

Answer: a
Explanation: Bluetooth operates on 2.45 GHz frequency ISM band for transmission. It is used to create a wireless personal area network for data transfer up to a distance of 10 meters.

9. Which of the following is an advantage of anomaly detection?
a) Rules are easy to define
b) Custom protocols can be easily analyzed
c) The engine can scale as the rule set grows
d) Malicious activity that falls within normal usage patterns is detected

Answer: c
Explanation: Once a protocol has been built and a behavior defined, the engine can scale more quickly and easily than the signature-based model because a new signature does not have to be created for every attack and potential variant.

10. “Semantics-aware” signatures automatically generated by Nemean are based on traffic at which two layers?
a) Application layer and Transport layer
b) Network layer and Application layer
c) Session layer and Transport layer
d) Application layer and Session layer

Answer: d
Explanation: Nemean automatically generates “semantics-aware” signatures based on traffic at the session and application layers. These signatures are used to ensure that no malicious operation is contained in the traffic.

11. Which protocol does the PPP protocol provide for handling the capabilities of the connection/link on the network?
a) LCP
b) NCP
c) Both LCP and NCP
d) TCP

Answer: c
Explanation: LCP stands for Link Control Protocol and NCP stands for Network Control Protocol. LCP and NCP are the PPP protocols which provide interface for handling the capabilities of the connection/link on the network.

12. PPP consists of _____components
a) Three (encapsulating, the Domain Name system)
b) Three (encapsulating, a link control protocol, NCP)
c) Two (a link control protocol, Simple Network Control protocol)
d) One (Simple Network Control protocol)

Answer: b
Explanation: PPP consists of three components namely Link Control Protocol (LCP), Network Control Protocol (NCP), and Encapsulation. LCP and NCP are the PPP protocols which provide interface for handling the capabilities of the connection/link on the network and encapsulation provides for multiplexing of different network-layer protocols.