Pure Aloha and Slotted ALoha

1. A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the requirement to make this frame collision-free?
a) 2msec
b) 4msec
c) 2sec
d) 4sec
View Answer

Answer: a
Explanation: Average frame transmission time
Tfr = 200 bits/200 kbps or 1 ms
Vulnerable time = 2x Tfr = 2 × 1 ms = 2 ms.

2. A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces 1000 frames per second?
a) 150 frames
b) 80 frames
c) 135 frames
d) 96 frames
View Answer

Answer: c
Explanation: Frame transmission time
Tfr= 200/200 kbps or 1 ms.
If the system creates 1000 frames per second, or 1 frame
per millisecond, then G = 1
S = G × e−2G = 0.135 (13.5 percent)
This means that,
Throughput =1000 × 0.135 = 135 frames.

3. A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces 500 frames per second?
a) 146 frames
b) 92 frames
c) 38 frames
d) 156 frames
View Answer

Answer: b
Explanation: If the system creates 500 frames per second, or 1/2 frames per millisecond.
Then G = 1/2.
S = G × e−2G = 0.184 (18.4 percent)
This means that

Throughput = 500 × 0.184 = 92
Only 92 frames out of 500 will probably survive
This is the maximum throughput case, percentage-wise.

A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces 250 frames per second?

a) 38 frames
b) 48 frames
c) 96 frames
d) 126 frames
View Answer

Answer: a
Explanation: If the system creates 250 frames per second, or 1/4 frames per millisecond, then G = ¼.
S = G × e−2G = 0.152 (15.2 percent).
This means that
Throughput = 250 × 0.152 = 38.
Only 38 frames out of 250 will probably survive.

5. A slotted ALOHA network transmits 200-bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system (all stations together) produces 1000 frames per second.
a) 92 frames
b) 368 frames
c) 276 frames
d) 151 frames
View Answer

Answer: b
Explanation: G =1 S=G×e−G=0.368 (36.8%)
Throughput = 1000 × 0.0368 = 368 frames.

6. A slotted ALOHA network transmits 200-bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system (all stations together) produces 500 frames per second.
a) 92 frames
b) 368 frames
c) 276 frames
d) 151 frames
View Answer

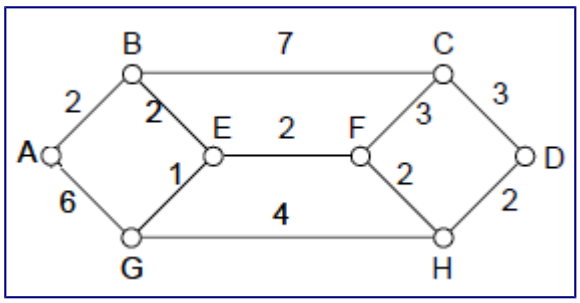
Answer: d
Explanation: G=1/2 S = G × e−G = 0.303 (30.3 percent)
Throughput is 500 × 0.0303 = 151.

7. A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal, as we see later) is 25.6 μs, what is the minimum size of the frame?
a) 128 bytes
b) 32 bytes
c) 16 bytes
d) 64 bytes
View Answer

Answer: d
Explanation: The minimum frame transmission time is Tfr = 2 × Tp = 51.2 μs. This means, in the worst case, a station needs to transmit for a period of 51.2 μs to detect the collision.
The minimum size of the frame is 10 Mbps × 51.2 μs = 512 bits or 64 bytes. This is actually the minimum size of the frame for Standard Ethernet.

8. In collision free protocol channel efficiency is given by-
a) d/(d + log2(N))
b) d*(d + log2(N))
c) log2(N)
d) (d + log2(N))
View Answer

Answer: a
Explanation: In collision free protocol channel efficiency is given by d/(d + log2(N)).

9. 

Find the distance from source A to destination D using Dijkstra algorithm.

a) 10

b) 11

c) 12

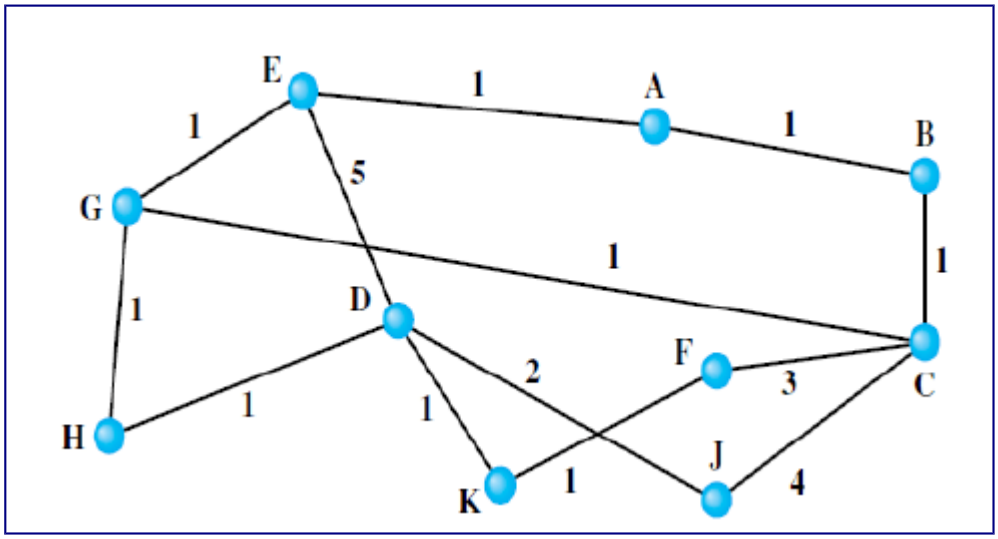
d) 14

View Answer

Answer: a

Explanation:

The shortest path form A to D is ABEFHD and distance is 10.

10. 

Find the distance from source A to destination D using Dijkstra algorithm.

a) A-B-C-J-D-K

b) A-B-C-G-H-D-K

c) A-E-D-K

d) A-E-G-H-D-K

View Answer

Answer: d

Explanation:

Shortest path is: A-E-G-H-D-K and the distance is 5 units.

11. After performing bit stuffing on the following stream : 01101111111111111110010, the output is-

a) 011011111011111011111100010

b) 011011111111111111110010111
c) 100100000000000000000001101
d) 01101111111111111111110010
View Answer

Answer: a
Explanation: Bit stuffing involves adding a 0 after every five 1s during transmission.

MCQs on Point to Point Protocols

1. Both HDLC and PPP are Data link layer protocols.
a) True
b) False
View Answer

Answer: a
Explanation: Both HDLC and PPP both are Data link layer protocol. HDLC stands for High level Data Link Control and PPP stands for Point to Point Protocol.

2. 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
View Answer

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.

3. The PPP protocol _____
a) Is designed for simple links which transport packets between two peers
b) Is one of the protocols for making an Internet connection over a phone line
c) Is designed for simple links which transport packets between two peers and making an Internet connection over a phone line
d) Is used for sharing bandwidth
View Answer

Answer: c
Explanation: The PPP protocol is designed for handling simple links which transport packets between two peers. It is a standard protocol that is used to make an Internet connection over phone lines.

4. PPP provides the _____ layer in the TCP/IP suite.
a) Link
b) Network
c) Transport
d) Application
View Answer

Answer: a
Explanation: PPP provides function of the link layer in the TCP/IP suite. It focuses on the link between two nodes that is going to be used by the users to communicate. It can use pre-installed phone line for the purpose.

5. 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)
View Answer

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.

6. The PPP encapsulation _____
a) Provides for multiplexing of different network-layer protocols
b) Requires framing to indicate the beginning and end of the encapsulation
c) Establishing, configuring and testing the data-link connection
d) Provides interface for handling the capabilities of the connection/link on the network
View Answer

Answer: a
Explanation: Encapsulation is a part of PPP which provides means for multiplexing of different network-layer protocols. The other two parts of PPP are Link Control Protocol and Network Control Protocol.

7. A Link Control Protocol (LCP) is used for _____
a) Establishing, configuring and testing the data-link connection

b) Establishing and configuring different network-layer protocols
c) Testing the different network-layer protocols
d) Provides for multiplexing of different network-layer protocols
View Answer

Answer: a
Explanation: The Link Control Protocol (LCP) is the part of PPP that is used for establishing, configuring and testing the data-link connection. The other two components are Network Control Protocol and Encapsulation.

8. A family of network control protocols (NCPs) _____
a) Are a series of independently defined protocols that provide a dynamic
b) Are a series of independently-defined protocols that encapsulate
c) Are a series of independently defined protocols that provide transparent
d) The same as NFS
View Answer

Answer: b
Explanation: The family of network control protocols (NCPs) is a series of independently-defined protocols that encapsulate the data flowing between the two nodes. It provides means for the network nodes to control the link traffic.

9. Choose the correct statement from the following.
a) PPP can terminate the link at any time
b) PPP can terminate the link only during the link establishment phase
c) PPP can terminate the link during the authentication phase
d) PPP can terminate the link during the callback control phase
View Answer

Answer: a
Explanation: PPP allows termination of the link at any time in any phase because it works on the data link layer which is the layer in control of the link of the communication.

10. The link necessarily begins and ends with this phase. During the _____ phase, the LCP automata will be in INITIAL or STARTING states.
a) Link-termination phase
b) Link establishment phase
c) Authentication phase
d) Link dead phase
View Answer

Answer: d
Explanation: The link necessarily begins and ends with the link dead phase. During this phase, the LCP automata will be in the initial or its final state. The link is non-functioning or inactive during the link dead phase.

CSMA/CD

81. In token passing method, the stations are organized in the logical

a. ring
b. bus
c. star
d. hybrid

Answer: (a).ring

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82. The function that is used whenever the primary device is ready to receive is called

a. poll function
b. select function
c. token-passing
d. channelization

Answer: (a).poll function

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83. The protocol that was developed at the University of Hawaii is

a. CSMA/CA
b. CSMA/CD
c. ALOHA
d. FDMA

Answer: (c).ALOHA

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84. The level of energy between sender and receiver is almost same in the

a. Wireless Network
b. Wired Network
c. Wi-Fi Network
d. DSL Network

Answer: (b).Wired Network

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85. In Carrier Sense Multiple Access/ Collision Detection, the signal from second station needs to add a significant amount of

a. Signals
b. Frames
c. Energy
d. Collision

Answer: (c).Energy

86. A station of Carrier Sense Multiple Access/Collision Detection (CSMA/CD) that has a frame to send needs to monitor the

a. Collision Level
b. Signal Level
c. Energy Level
d. Sense Level

Answer: (c).Energy Level

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87. The number of sequences in a Walsh table needs to be

a. N= 2m
b. N= 3m
c. N= 4m
d. N= 6m

Answer: (a).N= 2m

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88. Logical ring topology is designed by

a. HP
b. IBM
c. Dell
d. Apple

Answer: (b).IBM

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89. In CSMA/CA, An amount of time divided into slots is known as

a. Contention Procedure
b. Contention Window
c. Contention Signals
d. Contention Energy

Answer: (b).Contention Window

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90. The method in which one channel carries all transmissions simultaneously is

a. TDMA
b. CDMA
c. FDMA
d. CSMA

Answer: (b).CDMA

TDMA

In Time Division Multiple Access (TDMA), the stations share the bandwidth of the channel in

a. Time
b. Station
c. Data
d. Signals

Answer: (a).Time

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92. In the logical ring, the successor is the station which is

a. along the station
b. before the station
c. after the station
d. not in the station

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93. In Chip sequence, if we multiply a sequence by a number, every element in the sequence is multiplied by that element is called

a. inner product of two equal sequences
b. multiplication of a sequence by a vector
c. multiplication of a sequence by a scalar
d. inner product of two different sequences

Answer: (c).multiplication of a sequence by a scalar

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94. The station on a wireless ALOHA network is the maximum of

a. 400 Km
b. 500 Km
c. 600 Km
d. 700 Km

Answer: (c).600 Km

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95. The frame transmission time in Pure ALOHA is

a. 25/50 kbps

b. 100/1000 kbps
c. 100/150 kbps
d. 200/200 kbps

Answer: (d).200/200 kbps

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96. The original ALOHA protocol is called
a. simple ALOHA
b. pure ALOHA
c. CSMA
d. FDMA

Answer: (b).pure ALOHA

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97. When the number of sequence, N=128 then total stations in the network is
a. 100
b. 90
c. 80
d. 70

Answer: (b).90

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98. The corresponding box of Carrier Sense Multiple Access/Collision Detection can be replaced by one of the
a. nonpersistant process
b. I-persistent process
c. persistent process
d. p-persistent process

Answer: (c).persistent process

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99. Random access is also called the
a. controlled access
b. channelization
c. authentication
d. contention methods

Answer: (d).contention methods

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100. The time-out period is equal to the maximum possible propagation delay of
a. Square-trip
b. Round-trip

c. Rectangular-trip
d. Triangle-trip

Answer: (b).Round-trip