(VU RANK)

CS601-700 Solved MCQs

1. In a _____ connection, more than two devices can share a single link.
a. Point-to-point
b. Primary
c. Multipoint
d. Secondary
answer (c): Multipoint

2. Communication between a computer and a keyboard involves _____ transmission
a. Full-duplex
b. Half-duplex
c. Simplex
d. Automatic
answer (c): Simplex

3. In a network with 25 computers, which topology would require the most extensive cabling?
a. Star
b. Mesh
c. Bus
d. Ring
answer (b): Mesh

4. Which topology requires a central controller or hub?
a. Star
b. Mesh
c. Bus
d. Ring
answer (a): Star

5. The _____ is the physical path over which a message travels.
a. Protocol
b. Medium
c. Signal
d. All of the above
answer (b): Medium

6. Which organization has authority over interstate and international commerce in the communications field?
a. ITU-T
b. IEEE
c. ISO
d. FCC
answer (d): FCC

7. The information to be communicated in a data communications system is the _____
a. Medium
b. Protocol
c. Transmission
d. Message
answer (d): Message

8. Frequency of failure and network recovery time after a failure are measures of the _____ of a network.
a. Performance
b. Security
c. Reliability
d. Feasibility
answer (c): Reliability

9. In _____ transmission, the channel capacity is shared by both communicating devices at all times.
a. Full-duplex

b. Simplex
c. Half-duplex
d. Half-Simplex
answer (a): Full-duplex

10. An unauthorized user is a network _____ issue.
a. Performance
b. Reliability
c. Security
d. All of the above
answer (c): Security

11. Which topology requires a multipoint connection?
a. Mesh
b. Star
c. Ring
d. Bus
answer (d): Bus

12. A television broadcast is an example of _____ transmission.
a. Half-duplex
b. Full-duplex
c. Simplex
d. Automatic
answer (c): Simplex

13. A _____ connection provides a dedicated link between two devices.
a. Multipoint
b. Point-to-Point
c. Primary
d. Secondary
answer (b): Point-to-Point

14. A cable break in a _____ topology stops all transmission.
a. Mesh
b. Star
c. Primary
d. Bus
answer (d): Bus

Chapter 2: Network Models

15. The _____ layer changes bits into electromagnetic signals.
a. Physical
b. Transport
c. None of the above
d. Data link
answer (a): Physical

16. The physical layer is concerned with the transmission of _____ over the physical medium.
a. Programs
b. Protocols
c. Bits
d. Dialogs
The correct **answer** is c

17. Mail services are available to network users through the _____ layer.
a. Data link
b. Physical
c. Application
d. Transport
The correct **answer** is c

18. As the data packet moves from the lower to the upper layers, headers are _____.
a. Added

b. Rearranged
c. Modified
d. Subtracted
The correct **answer** is d
Your **answer** is b

19. As the data packet moves from the upper to the lower layers, headers are _____.
a. Removed
b. Added
c. Rearranged
d. Modified
The correct **answer** is b

20. The _____ layer lies between the network layer and the application layer.
a. Data link
b. Physical
c. Transport
d. None of the above
The correct **answer** is c

21. Layer 2 lies between the physical layer and the _____ layer.
a. Data link
b. Network
c. Transport
d. None of the above
The correct **answer** is b
Your **answer** is b

22. When data are transmitted from device A to device B, the header from A's layer 4 is read by B's _____ layer.
a. Application
b. Physical
c. Transport
d. None of the above
The correct **answer** is c
Your **answer** is a

23. Which layer functions as a liaison between user support layers and network support layers?
a. Network layer
b. Transport layer
c. Physical layer
d. Application layer
The correct **answer** is b

24. What is the main function of the transport layer?
a. Process-to-process delivery
b. Node-to-node delivery
c. Synchronization
d. Updating and maintenance of routing tables
The correct **answer** is a

25. Which of the following is an application layer service?
a. Remote log-in
b. File transfer and access
c. Mail service
d. All the above
The correct **answer** is d

26. The Internet model consists of _____ layers.
a. Three
b. Five
c. Seven
d. Eight
The correct **answer** is b

27. The process-to-process delivery of the entire message is the responsibility of the

_____ layer.

a. Physical
b. Network
c. Transport
d. Application

The correct **answer** is c

28. The _____ layer is the layer closest to the transmission medium.

a. Network
b. Physical
c. Data link
d. Transport

The correct **answer** is b

Chapter 3: Signals

29. Before data can be transmitted, they must be transformed to _____.

a. Electromagnetic signals
b. Periodic signals
c. Aperiodic signals
d. Low-frequency sine waves

The correct **answer** is a

30. When one of the components of a signal has a frequency of zero, the average amplitude of the signal _____.

a. Is less than zero
b. Is greater than zero
c. Is zero
d. (a) or (b)

The correct **answer** is b

31. A periodic signal can always be decomposed into _____.

a. Exactly an odd number of sine waves
b. A set of sine waves, one of which must have a phase of 0°
c. A set of sine waves
d. None of the above

The correct **answer** is c

32. A periodic signal completes one cycle in 0.001 s. What is the frequency?

a. 1 Hz
b. 100 Hz
c. 1 KHz
d. 1 MHz

The correct **answer** is c

33. In a frequency-domain plot, the horizontal axis measures the _____.

a. Frequency
b. Peak amplitude
c. Phase
d. Slope

The correct **answer** is a

34. In a time-domain plot, the vertical axis is a measure of _____.

a. Frequency
b. Phase
c. Amplitude
d. Time

The correct **answer** is c

35. In a time-domain plot, the horizontal axis is a measure of _____.

a. Signal amplitude
b. Time
c. Frequency
d. Phase
The correct **answer** is b

36. If the bandwidth of a signal is 5 KHz and the lowest frequency is 52 KHz, what is the highest frequency?
a. 5 KHz
b. 10 KHz
c. 47 KHz
d. 57 KHz
The correct **answer** is d

37.
Your **answer** is a

38. What is the bandwidth of a signal that ranges from 40 KHz to 4 MHz?
a. 3.96 MHz
b. 36 MHz
c. 360 KHz
d. 396 KHz
The correct **answer** is a

39. As frequency increases, the period _____.
a. Decreases
b. Increases
c. Remains the same
d. Doubles
The correct **answer** is a

40. When propagation speed is multiplied by propagation time, we get the _____.
a. Throughput
b. Wavelength of the signal
c. Distance a signal or bit has traveled
d. Distortion factor
The correct **answer** is c

41. Propagation time is _____ proportional to distance and _____ proportional to propagation speed.
a. Inversely; directly
b. Inversely; inversely
c. Directly; inversely
d. Directly; directly
The correct **answer** is c

42. Wavelength is _____ proportional to propagation speed and _____ proportional to period.
a. Directly; directly
b. Inversely; directly
c. Directly; inversely
d. Inversely; inversely
The correct **answer** is a

43. Which of the following can be determined from a frequency-domain graph of a signal?
a. Phase
b. Power
c. Frequency
d. All the above
The correct **answer** is c

44. Which of the following can be determined from a frequency-domain graph of a signal?
a. Phase
b. Bandwidth
c. Power

d. All the above

The correct **answer** is b

45. In a frequency-domain plot, the vertical axis measures the _____.
a. Frequency
b. Peak amplitude
c. Phase
d. Slope

The correct **answer** is b

46. Given two sine waves A and B, if the frequency of A is twice that of B, then the period of B is _____ that of A.
a. One-half
b. Twice
c. The same as
d. Indeterminate from

The correct **answer** is b

47. The wavelength of green light in air is _____ the wavelength of green light in fiber-optic cable.
a. Greater than
b. Less than
c. Equal to
d. None of the above

The correct **answer** is b

48. Using the Shannon formula to calculate the data rate for a given channel, if C = B, then _____.
a. The signal is equal to the noise
b. The signal is less than the noise
c. The signal is greater than the noise
d. Not enough information is given to **answer** the question

The correct **answer** is a

49. A sine wave is _____.
a. Aperiodic and continuous
b. Periodic and discrete
c. Aperiodic and discrete
d. Periodic and continuous

The correct **answer** is d

50. If the maximum amplitude of a sine wave is 2 V, the minimum amplitude is _____ V.
a. 2
b. 1
c. -2
d. Between -2 and 2

The correct **answer** is c

51. A signal is measured at two different points. The power is P1 at the first point and P2 at the second point. The dB is 0. This means _____.
a. P2 is zero
b. P2 equals P1
c. P2 is much larger than P1
d. P2 is much smaller than P1

The correct **answer** is b

52. _____ is a type of transmission impairment in which the signal loses strength due to the resistance of the transmission medium.
a. Distortion
b. Noise
c. Decibel
d. Attenuation

The correct **answer** is d

53. _____ is a type of transmission impairment in which the signal loses strength due to the different propagation speeds of each frequency that makes up the signal.
a. Attenuation
b. Noise
c. Distortion
d. Decibel
The correct **answer** is c

54. _____ is a type of transmission impairment in which an outside source such as crosstalk corrupts a signal.
a. Attenuation
b. Noise
c. Distortion
d. Decibel
The correct **answer** is b

55.
The _____ has units of meters/second or kilometers/second.
a. Throughput
b. Propagation time
c. Propagation speed
d. (b) and (c)
The correct **answer** is c

56. _____ has units of bits/second.
a. Throughput
b. Propagation speed
c. Propagation time
d. (b) and (c)
The correct **answer** is a

57. The _____ has units of seconds.
a. Throughput
b. Propagation time
c. Propagation speed
d. (a) and (b)
The correct **answer** is b

58.
The wavelength of a signal depends on the _____.
a. Frequencies of the signal
b. Medium
c. Phase of the signal
d. (a) and (b)
The correct **answer** is d

Chapter 4: Encoding and Modulation

59. Which encoding technique attempts to solve the loss of synchronization due to long strings of 0s?
a. NRZ
b. BnZS
c. AMI
d. (a) and (b)
The correct **answer** is b

60. Block coding can help in _____ at the receiver.
a. Synchronization
b. Error detection
c. Attenuation
d. (a) and (b)
The correct **answer** is d

61. In _____ transmission, bits are transmitted simultaneously, each across its own wire.
a. Parallel
b. Asynchronous serial
c. Synchronous serial
d. (a) and (b)
The correct **answer** is a

62. Unipolar, bipolar, and polar encoding are types of _____ encoding.
a. Block
b. Line
c. NRZ
d. Manchester
The correct **answer** is b

63. _____ encoding has a transition at the middle of each bit.
a. RZ
b. Manchester
c. Differential Manchester
d. All the above
The correct **answer** is d

64. _____ encoding has a transition at the beginning of each 0 bit.
a. Differential Manchester
b. RZ
c. Manchester
d. All the above
The correct **answer** is a

65. PCM is an example of _____ conversion.
a. Analog-to-analog
b. Analog-to-digital
c. Digital-to-digital
d. Digital-to-analog
The correct **answer** is b

66. If the frequency spectrum of a signal has a bandwidth of 500 Hz with the highest frequency at 600 Hz, what should be the sampling rate, according to the Nyquist theorem?
a. 500 samples/s
b. 1000 samples/s
c. 200 samples/s
d. 1200 samples/s
The correct **answer** is d

67. One factor in the accuracy of a reconstructed PCM signal is the _____.
a. Number of bits used for quantization
b. Signal bandwidth
c. Carrier frequency
d. Baud rate
The correct **answer** is a

68. In asynchronous transmission, the gap time between bytes is _____.
a. Fixed
b. A function of the data rate
c. Variable
d. Zero
The correct **answer** is c

69. Synchronous transmission does not have _____.
a. A start bit
b. A stop bit
c. Gaps between bytes
d. All the above

The correct **answer** is d

70. Which encoding type always has a nonzero average amplitude?
a. Polar
b. Bipolar
c. Unipolar
d. All the above
The correct **answer** is c

71. Which of the following encoding methods does not provide for synchronization?
a. Manchester
b. NRZ-L
c. RZ
d. NRZ-I
The correct **answer** is b

72. Which encoding method uses alternating positive and negative values for 1s?
a. Manchester
b. AMI
c. NRZ-I
d. RZ
The correct **answer** is b

73. In PCM, an analog-to- _____ conversion occurs.
a. Analog
b. Digital
c. QAM
d. Differential
The correct **answer** is b

74. If the maximum value of a PCM signal is 31 and the minimum value is -31, how many bits were used for coding?
a. 4
b. 5
c. 6
d. 7
The correct **answer** is c

75. RZ encoding involves _____ signal levels.
a. Five
b. Four
c. Three
d. Two
The correct **answer** is c

76. Which quantization level results in a more faithful reproduction of the signal?
a. 2
b. 8
c. 16
d. 32
The correct **answer** is d

77. In _____ transmission, bits are transmitted over a single wire, one at a time.
a. Asynchronous serial
b. Synchronous serial
c. Parallel
d. (a) and (b)
The correct **answer** is d

78. In _____ transmission, a start bit and a stop bit frame a character byte.
a. Synchronous serial
b. Asynchronous serial
c. Parallel

d. (a) and (b)

The correct **answer** is b

79. If a symbol is composed of 3 bits, there are _____ data levels.
a. 2
b. 4
c. 8
d. 16

The correct **answer** is c

80. The Nyquist theorem specifies the minimum sampling rate to be_____.
a. Twice the bandwidth of a signal
b. Twice the highest frequency of a signal
c. Equal to the lowest frequency of a signal
d. Equal to the highest frequency of a signal

The correct **answer** is b

81. Pulse rate is always _____ the bit rate.
a. Less than
b. Less than or equal to
c. Greater than
d. Greater than or equal to

The correct **answer** is b

Chapter 5: Multiplexing

82. AM and FM are examples of _____ modulation.
a. Analog-to-analog
b. Analog-to-digital
c. Digital-to-digital
d. Digital-to-analog

The correct **answer** is a

Your **answer** is a

83. In QAM, both phase and _____ of a carrier frequency are varied.
a. Frequency
b. Bit rate
c. Amplitude
d. Baud rate

The correct **answer** is c

84. Which of the following is most affected by noise?
a. PSK
b. FSK
c. QAM
d. ASK

The correct **answer** is d

85. ASK, PSK, FSK, and QAM are examples of _____ modulation.
a. Analog-to-analog
b. Analog-to-digital
c. Digital-to-digital
d. Digital-to-analog

The correct **answer** is d

86. If the baud rate is 400 for a 4-PSK signal, the bit rate is _____ bps.
a. 1600 100
b. 800
c. 400
d. 100

The correct **answer** is b

87. If the bit rate for an ASK signal is 1200 bps, the baud rate is _____.
a. 300
b. 400
c. 600
d. 1200

The correct **answer** is d

88. As the bit rate of an FSK signal increases, the bandwidth _____.
a. Remains the same
b. Decreases
c. Increases
d. Doubles

The correct **answer** is c

89. In 16-QAM, there are 16 _____.
a. Phases
b. Combinations of phase and amplitude
c. Amplitudes
d. bps

The correct **answer** is b

90. Which modulation technique involves tribits, eight different phase shifts, and one amplitude?
a. FSK
b. ASK
c. 4-PSK
d. 8-PSK

The correct **answer** is d

91. If the bit rate for an FSK signal is 1200 bps, the baud rate is _____.
a. 300
b. 400
c. 600
d. 1200

The correct **answer** is d

92. If the bit rate for a QAM signal is 3000 bps and a signal unit is represented by a tribit, what is the baud rate?
a. 300
b. 400
c. 1000
d. 1200

The correct **answer** is c

93. If the baud rate for a QAM signal is 3000 and a signal unit is represented by a tribit, what is the bit rate?
a. 300
b. 400
c. 1000
d. 9000

The correct **answer** is d

94. If the baud rate for a QAM signal is 1800 and the bit rate is 9000, how many bits are there per signal unit?
a. 3
b. 4
c. 5
d. 6

The correct **answer** is c

95. Given an AM radio signal with a bandwidth of 10 KHz and the highest-frequency component at 705 KHz, what is the frequency of the carrier signal?
a. 705 KHz
b. 700 KHz

c. 710 KHz
d. Cannot be determined from given information
The correct **answer** is b

96. A modulated signal is formed by _____.
a. Changing the carrier wave by the modulating signal
b. Quantization of the source data
c. Changing the modulating signal by the carrier wave
d. Sampling at the Nyquist frequency
The correct **answer** is a

97. If FCC regulations are followed, the carrier frequencies of adjacent AM radio stations are _____ apart.
a. 5 KHz
b. 10 KHz
c. 200 KHz
d. 530 KHz
The correct **answer** is b

98. If FCC regulations are followed, _____ potential FM stations are theoretically possible in a given area.
a. 50
b. 100
c. 133
d. 150
The correct **answer** is a

99. When an ASK signal is decomposed, the result is _____.
a. An infinite number of sine waves
b. Always one sine wave
c. Always two sine waves
d. None of the above
The correct **answer** is a

100. The bandwidth of an FM signal requires 10 times the bandwidth of the _____ signal.
a. Bipolar
b. Sampling
c. Carrier
d. Modulating
The correct **answer** is d

101. Modulation of an analog signal can be accomplished through changing the _____ of the carrier signal.
a. Amplitude
b. Frequency
c. Phase
d. Any of the above
The correct **answer** is d

102. For a telephone line, the bandwidth for voice is usually _____ the bandwidth for data.
a. Less than
b. Greater than
c. Twice
d. Equivalent to
The correct **answer** is b

103. For a given bit rate, the minimum bandwidth for ASK is _____ the minimum bandwidth for FSK.
a. Less than
b. Equivalent to
c. Greater than
d. Twice
The correct **answer** is a

104. What is the object of trellis coding?
a. To narrow the bandwidth

b. To increase the data rate
c. To reduce the error rate
d. To simplify modulation
The correct **answer** is c

105. A modulator converts a(n)_____ signal to a(n) _____ signal.
a. Digital; analog
b. Analog; digital
c. PSK; FSK
d. FSK; PSK
The correct **answer** is a

106. A 56K modem can download at a rate of _____ Kbps and upload at a rate of _____ Kbps.
a. 56.6; 33.6
b. 56.6; 56.6
c. 33.6; 33.6
d. 33.6; 56.6
The correct **answer** is a

107. For FSK, as the difference between the two carrier frequencies increases, the bandwidth _____.
a. Remains the same
b. Decreases
c. Increases
d. Halves
The correct **answer** is c

108. The bit rate always equals the baud rate in which type of signal?
a. FSK
b. QAM
c. 4-PSK
d. All the above
The correct **answer** is a

109. Which ITU-T modem standard uses trellis coding?
a. V.32
b. V.33
c. V.34
d. (a) and (b)
The correct **answer** is a

110. In trellis coding the number of data bits is _____ the number of transmitted bits.

a. Less than
b. More than
c. Equal to
d. Double that of
The correct **answer** is a

Chapter 6: Switching
111. Which multiplexing technique transmits digital signals?
a. WDM
b. FDM
c. TDM
d. None of the above
The correct **answer** is c

112. Which multiplexing technique shifts each signal to a different carrier frequency?
a. TDM
b. FDM
c. Both (a) and (b)
d. None of the above

The correct **answer** is b

113. In TDM, for n signal sources of the same data rate, each frame contains _____ slots.
a. 0 to n
b. n
c. n + 1
d. n - 1
The correct **answer** is b

114. In TDM, the transmission rate of the multiplexed path is usually _____ the sum of the transmission rates of the signal sources.
a. 1 less than
b. Greater than
c. Less than
d. Equal to
The correct **answer** is b

115. DS-1 through DS-4 are _____ while T-1 through T-4 are _____.
a. Services; signals
b. Services; lines
c. Services; multiplexers
d. Multiplexers; signals
The correct **answer** is b

116. The sharing of a medium and its link by two or more devices is called _____.
a. Modulation
b. Encoding
c. Multiplexing
d. Line discipline
The correct **answer** is c

117. In AT&T's FDM hierarchy, the bandwidth of each group type can be found by multiplying _____ and adding extra bandwidth for guard bands.
a. The sampling rate by 4000 Hz
b. The number of voice channels by 4000 Hz
c. The number of voice channels by 8 bits/sample
d. The sampling rate by 8 bits/sample
The correct **answer** is b

118. Guard bands increase the bandwidth for _____.
a. TDM
b. FDM
c. Both (a) and (b)
d. None of the above
The correct **answer** is b

119. Which multiplexing technique transmits analog signals?
a. FDM
b. TDM
c. WDM
d. (a) and (c)
The correct **answer** is d

120. In a T-1 line, _____ interleaving occurs.
a. Bit
b. Byte
c. DS-0
d. Switch
The correct **answer** is b

121. Which multiplexing technique involves signals composed of light beams?
a. WDM

b. FDM
c. TDM
d. None of the above
The correct **answer** is a

Chapter 7: Transmission Media
122. The VLF and LF bands use _____ propagation for communications.
a. Space
b. Ground
c. Sky
d. Line of sight
The correct **answer** is b

123. Category 1 UTP cable is most often used in _____ networks.
a. Infrared
b. Telephone
c. Fast Ethernet
d. Traditional Ethernet
The correct **answer** is b

124. BNC connectors are used by _____ cables.
a. Fiber-optic
b. UTP
c. STP
d. Coaxial
The correct **answer** is d

125. Which of the following is not a guided medium?
a. Twisted-pair cable
b. Fiber-optic cable
c. Atmosphere
d. Coaxial cable
The correct **answer** is c

126. In an environment with many high-voltage devices, the best transmission medium would be _____.
a. Twisted-pair cable
b. Coaxial cable
c. The atmosphere
d. Optical fiber
The correct **answer** is d

127. _____ cable consists of an inner copper core and a second conducting outer sheath.
a. Coaxial
b. Twisted-pair
c. Fiber-optic
d. Shielded twisted-pair
The correct **answer** is a

128. In fiber optics, the signal source is _____ waves.
a. Very low-frequency
b. Light
c. Radio
d. Infrared
The correct **answer** is b

129. Smoke signals are an example of communication through _____.
a. A guided medium
b. A refractive medium
c. An unguided medium
d. A small or large medium
The correct **answer** is c

130. Which of the following primarily uses guided media?
a. Cellular telephone system
b. Satellite communications
c. Local telephone system
d. Radio broadcasting
The correct **answer** is c

131. What is the major factor that makes coaxial cable less susceptible to noise than twisted-pair cable?
a. Outer conductor
b. Inner conductor
c. Diameter of cable
d. Insulating material
The correct **answer** is a

132. The RG number gives us information about _____.
a. Optical fibers
b. Twisted pairs
c. Coaxial cables
d. All the above
The correct **answer** is c

133. Transmission media are usually categorized as _____.
a. Guided or unguided
b. Fixed or unfixed
c. Determinate or indeterminate
d. Metallic or nonmetallic
The correct **answer** is a

134. The _____ is an association that sponsors the use of infrared waves.
a. EIA
b. IrDA
c. FCC
d. PUD
The correct **answer** is b

135. In an optical fiber, the inner core is _____ the cladding.
a. Less dense than
b. Denser than
c. The same density as
d. Another name for
The correct **answer** is b

136. The inner core of an optical fiber is _____ in composition.
a. Copper
b. Bimetallic
c. Glass or plastic
d. Liquid
The correct **answer** is c

137. When a beam of light travels through media of two different densities, if the angle of incidence is greater than the critical angle, _____ occurs.
a. Refraction
b. Reflection
c. Incidence
d. Criticism
The correct **answer** is b

138. In _____ propagation, the beam of propagated light is almost horizontal, and the low-density core has a small diameter compared to the cores of the other propagation modes.
a. Single-mode
b. Multimode step-index

c. Multimode graded-index
d. Multimode single-index
The correct **answer** is a

139. _____ is the propagation method subject to the greatest distortion.
a. Single-mode
b. Multimode step-index
c. Multimode graded-index
d. Multimode single-index
The correct **answer** is b

140. In _____ propagation, the core is of varying densities.
a. Single-mode
b. Multimode step-index
c. Multimode graded-index
d. Multimode single-index
The correct **answer** is c

141. When we talk about unguided media, usually we are referring to _____.
a. Metallic wires
b. Nonmetallic wires
c. The air
d. None of the above
The correct **answer** is c

142. Transmission media are closest to the _____ layer.
a. Application
b. Physical
c. Network
d. Transport
The correct **answer** is b

143. Radio wave and microwave frequencies range from _____.
a. 3 to 300 KHz
b. 300 KHz to 3 GHz
c. 3 KHz to 300 GHz
d. 3 KHz to 3000 GHz
The correct **answer** is c

144. Optical fibers, unlike wire media, are highly resistant to _____.
a. High-frequency transmission
b. Low-frequency transmission
c. Refraction
d. Electromagnetic interference
The correct **answer** is d

145. In _____ propagation, low-frequency radio waves hug the earth.
a. Space
b. Ground
c. Sky
d. Line of sight
The correct **answer** is b

146. When the angle of incidence is _____ the critical angle, the light beam bends along the interface.
a. More than
b. Less than
c. Equal to
d. None of the above
The correct **answer** is c

147. A parabolic dish antenna is a(n) _____ antenna.
a. Omnidirectional

b. Bidirectional
c. Horn
d. Unidirectional
The correct **answer** is d

Chapter 8 : Telephone, Cable, and Satellite Networks
148. The telephone service handled between two LATAs is called _____.
a. An ILEC
b. An IXC
c. A CLEC
d. A POP
The correct **answer** is b

149. How many crosspoints are needed in a single-stage switch with 40 inputs and 50 outputs?
a. 2000
b. 90
c. 50
d. 40
The correct **answer** is a

150. The _____ is a device that connects n inputs to m outputs.
a. Crossbar
b. Crosspoint
c. Modem
d. RAM
The correct **answer** is a

151. The established telephone company that provided services in a LATA before 1966 and owns the cabling system is called _____.
a. A CLEC
b. An IXC
c. An ILEC
d. A POP
The correct **answer** is c

152. In a crossbar with 1000 crosspoints, approximately how many are in use at any time?
a. 100
b. 250
c. 500
d. 1000
The correct **answer** is b

153. The _____ of a TSI controls the order of delivery of slot values that are stored in RAM.
a. Crossbar
b. Crosspoint
c. Transceiver
d. Control unit
The correct **answer** is d

154. Which of the following is a time-division switch?
a. TSI
b. TDM bus
c. Crosspoint
d. (a) and (b)
The correct **answer** is d

155. In a time-division switch, a _____ governs the destination of a packet stored in RAM.
a. Control unit
b. TDM bus
c. Crosspoint
d. Crossbar

The correct **answer** is a

156. A telephone network is an example of a _____ network.
a. Circuit-switched
b. Packet-switched
c. Message-switched
d. None of the above
The correct **answer** is a

157. The local loop has _____ cable that connects the subscriber telephone to the nearest end office.
a. Coaxial
b. Fiber-optic
c. Twisted-pair
d. (b) and (c)
The correct **answer** is c

158. Trunks are transmission media such as _____ that handle the telephone communication between offices.
a. Twisted-pair cable
b. Fiber-optic cable
c. Satellite links
d. (b) and (c)
The correct **answer** is d

159. A new telephone company that provides services in a LATA after 1966 is called _____.
a. An ILEC
b. An IXC
c. A POP
d. A CLEC
The correct **answer** is d

160. If the end office receives two bursts of analog signals with frequencies of 697 and 1477 Hz, then the number _____ has been punched.
a. 1
b. 2
c. 3
d. 4
The correct **answer** is c

161. In _____ circuit switching, delivery of data is delayed because data must be stored and retrieved from RAM.
a. Time-division
b. Space-division
c. Virtual
d. Packet
The correct **answer** is a

162. Data from a computer are _____; the local loop handles _____ signals.
a. Digital; digital
b. Digital; analog
c. Analog; analog
d. Analog; digital
The correct **answer** is b

163. To create a _____, combine crossbar switches in stages.
a. TSI
b. Multistage switch
c. Crosspoint
d. Packet switch
The correct **answer** is b

164. A traditional telephone line has a bandwidth of _____.
a. 2000 Hz
b. 4000 Hz

c. 2000 MHz
d. 4000 MHz
The correct **answer** is b

Chapter 9 : Flow and Error Control
165. SONET is a standard for _____ networks.
a. Twisted-pair cable
b. Fiber-optic cable
c. Coaxial cable
d. Ethernet
The correct **answer** is b

166. _____ limit the bandwidth of the local loop to 4 KHz.
a. Fiber nodes
b. Repeaters
c. Filters
d. Hubs
The correct **answer** is c

167. The actual bit rate of ADSL downstream data is _____.
a. 6 to 30 Kbps
b. 64 Kbps to 1 Mbps
c. 500 Kbps to 8 Mbps
d. 31 Kbps to 255 Mbps
The correct **answer** is c

168. _____ is a device at the telephone company site that can packetize data to be sent to the ISP server.
a. A filter
b. A splitter
c. A DSLAM
d. An ADSL modem
The correct **answer** is c

169. The standard for data transmission over an HFC network is called _____.
a. DOCSIS
b. CMTS
c. MCNS
d. ADSL
The correct **answer** is a

170. DMT is a modulation technique that combines elements of _____ and _____.
a. FDM; TDM
b. QDM; QAM
c. PSK; FSK
d. FDM; QAM
The correct **answer** is d

171. The _____ is an HFC network device installed inside the distribution hub that receives data from the Internet and passes them to the combiner.
a. DOCSIS
b. MCNS
c. CM
d. CMTS
The correct **answer** is d

172. HDSL encodes data using _____.
a. 6B/8T
b. 4B/5B
c. 2B1Q
d. 1B2Q
The correct **answer** is c

Your **answer** is a

173. _____ encoded signal is more susceptible to attenuation than _____ encoded signal.
a. An AMI; a 2B1Q
b. An AMI; a 2B2Q
c. A 2B1Q; an AMI
d. None of the above
The correct **answer** is a

174. Another name for the cable TV office is the _____.
a. Fiber node
b. Combiner
c. Head end
d. Splitter
The correct **answer** is c

175. A traditional cable TV network transmits signals _____.
a. Upstream and downstream
b. Upstream
c. Downstream
d. None of the above
The correct **answer** is c

176. _____ was designed as an alternative to the T-1 line.
a. VDSL
b. SDSL
c. HDSL
d. ADSL
The correct **answer** is c

177. The synchronous payload envelope of an STS-1 frame contains _____.
a. Pointers
b. User data
c. Overhead
d. (b) and (c)
The correct **answer** is d

178. _____ has a higher transmission rate in the downstream direction than in the upstream direction.
a. VDSL
b. ADSL
c. SDSL
d. (a) and (b)
The correct **answer** is d

179. An HFC network uses _____ as the medium from the switch to the fiber node.
a. UTP
b. STP
c. Optical fiber
d. Coaxial cable
The correct **answer** is c

180. In an HFC network, the distribution hub handles the _____ of signals.
a. Modulation
b. Distribution
c. Splitting
d. (a) and (b)
The correct **answer** is d

181. A TV channel in an HFC network needs a _____-MHz bandwidth.
a. 369
b. 6
c. 100

d. 250

The correct **answer** is b

182. _____ data go from the subscriber to the Internet.
a. Downstream
b. Upstream
c. Midstream
d. None of the above

The correct **answer** is b

183. In an HFC network, the upstream data are modulated using the _____ modulation technique.
a. PCM
b. QAM
c. QPSK
d. ASK

The correct **answer** is b

184. _____ is suitable for businesses that require comparable upstream and downstream data rates.
a. SDSL
b. VDSL
c. ADSL
d. (a) and (b)

The correct **answer** is a

185. SONET is an acronym for _____ Network.
a. Standard Optical
b. Symmetric Open
c. Synchronous Optical
d. Standard Open

The correct **answer** is c

186. The largest portion of the bandwidth for ADSL carries _____.
a. Voice communication
b. Downstream data
c. Upstream data
d. Control data

The correct **answer** is b

187. In a SONET system, _____ can remove signals from a path.
a. An add/drop multiplexer
b. A repeater
c. An STS multiplier
d. A regenerator

The correct **answer** is a

Chapter 10 : Access Method

188. Which of the following best describes a single-bit error?
a. A single bit is inverted.
b. A single bit is inverted per transmission.
c. A single bit is inverted per data unit.
d. Any of the above

The correct **answer** is c

189. Which error detection method uses ones complement arithmetic?
a. Simple parity check
b. Checksum
c. Two-dimensional parity check
d. CRC

The correct **answer** is b

190. Which error detection method consists of just one redundant bit per data unit?

a. Two-dimensional parity check
b. CRC
c. Simple parity check
d. Checksum
The correct **answer** is c

191. Which error detection method involves polynomials?
a. CRC
b. Simple parity check
c. Two-dimensional parity check
d. Checksum
The correct **answer** is a

192. If the ASCII character G is sent and the character D is received, what type of error is this?
a. Single-bit
b. Multiple-bit
c. Burst
d. Recoverable
The correct **answer** is c

193. If the ASCII character H is sent and the character I is received, what type of error is this?
a. Burst
b. Recoverable
c. Single-bit
d. Multiple-bit
The correct **answer** is c

194. In cyclic redundancy checking, what is the CRC?
a. The remainder
b. The divisor
c. The quotient
d. The dividend
The correct **answer** is a

195. Which error detection method involves the use of parity bits?
a. Simple parity check
b. Two-dimensional parity check
c. CRC
d. (a) and (b)
The correct **answer** is d

196. In cyclic redundancy checking, the divisor is _____ the CRC.
a. The same size as
b. 1 bit more than
c. 1 bit less than
d. 2 bits more than
The correct **answer** is b

197. If the data unit is 111111, the divisor 1010, and the remainder 110, what is the dividend at the receiver?
a. 111111011
b. 1010110
c. 111111110
d. 110111111
The correct **answer** is c

198. Which error detection method consists of a parity bit for each data unit as well as an entire data unit of parity bits?
a. Simple parity check
b. Checksum
c. Two-dimensional parity check
d. CRC
The correct **answer** is c

199. If the data unit is 111111 and the divisor 1010, what is the dividend at the transmitter?
a. 1111110000
b. 111111000
c. 111111
d. 1111111010
The correct **answer** is b

200. If odd parity is used for ASCII error detection, the number of 0s per 8-bit symbol is _____.
a. Indeterminate
b. 42
c. Even
d. Odd
The correct **answer** is d

201. In CRC there is no error if the remainder at the receiver is _____.
a. Nonzero
b. The quotient at the sender
c. Equal to the remainder at the sender
d. Zero
The correct **answer** is d

202. At the CRC generator, _____ added to the data unit after the division process.
a. 0s are
b. 1s are
c. The CRC remainder is
d. The polynomial is
The correct **answer** is c

203. The sum of the checksum and data at the receiver is _____ if there are no errors.
a. -0
b. +0
c. The complement of the checksum
d. The complement of the data
The correct **answer** is a

204. In CRC the quotient at the sender _____.
a. Becomes the dividend at the receiver
b. Becomes the divisor at the receiver
c. Is the remainder
d. Is discarded
The correct **answer** is d

205. The Hamming code is a method of _____.
a. Error detection
b. Error correction
c. Error encapsulation
d. (a) and (b)
The correct **answer** is d

206. At the CRC checker, _____ means that the data unit is damaged.
a. A string of alternating 1s and 0s
b. A nonzero remainder
c. A string of 0s
d. A string of 1s
The correct **answer** is b

207. Which error detection method can detect a single-bit error?
a. Simple parity check
b. Two-dimensional parity check
c. CRC
d. All the above
The correct **answer** is d

208. Which error detection method can detect a burst error?
a. The parity check
b. Two-dimensional parity check
c. CRC
d. (b) and (c)
The correct **answer** is d

209. At the CRC generator, _____ added to the data unit before the division process.
a. A polynomial is
b. A CRC remainder is
c. 0s are
d. 1s are
The correct **answer** is c

Chapter 11 : Wired Local Area Networks
210. HDLC is an acronym for _____.
a. High-duplex line communication
b. Half-duplex digital link combination
c. High-level data link control
d. Host double-level circuit
The correct **answer** is c

211. Flow control is needed to prevent _____.
a. Overflow of the sender buffer
b. Overflow of the receiver buffer
c. Bit errors
d. Collision between sender and receiver
The correct **answer** is b

212. In a Go-Back-N ARQ, if the window size is 63, what is the range of sequence numbers?
a. 1 to 63
b. 1 to 64
c. 0 to 63
d. 0 to 64
The correct **answer** is c

213. For a sliding window of size n - 1 (n sequence numbers), there can be a maximum of _____ frames sent but unacknowledged.
a. 0
b. n
c. n - 1
d. n + 1
The correct **answer** is b

214. When data and acknowledgment are sent on the same frame, this is called _____.
a. Backpacking
b. Piggypacking
c. Piggybacking
d. A good idea
The correct **answer** is c

215. In _____ ARQ, if a NAK is received, only the specific damaged or lost frame is retransmitted.
a. Go-Back-N
b. Stop-and-Wait
c. Selective Repeat
d. (a) and (b)
The correct **answer** is a

216. ARQ stands for _____.
a. Automatic repeat request

b. Automatic retransmission request
c. Acknowledge repeat request
d. Automatic repeat quantization
The correct **answer** is a

217. In Go-Back-N ARQ, if frames 4, 5, and 6 are received successfully, the receiver may send an ACK _____ to the sender.
a. 5
b. 6
c. 7
d. Any of the above
The correct **answer** is d

218. The shortest frame in HDLC protocol is usually the _____ frame.
a. Information
b. Management
c. Supervisory
d. None of the above
The correct **answer** is c

219. The address field of a frame in HDLC protocol contains the address of the _____ station.
a. Primary
b. Secondary
c. Tertiary
d. (a) or (b)
The correct **answer** is b

220. The HDLC _____ field defines the beginning and end of a frame.
a. Address
b. Control
c. Flag
d. FCS
The correct **answer** is c

221. A timer is set when _____ is (are) sent out.
a. An ACK
b. A NAK
c. A data frame
d. All the above
The correct **answer** is c

222. For Stop-and-Wait ARQ, for n data packets sent, _____ acknowledgments are needed.
a. n - 1
b. n + 1
c. n
d. 2n
The correct **answer** is c

223. What is present in all HDLC control fields?
a. N(R)
b. N(S)
c. Code bits
d. P/F bit
The correct **answer** is d

Chapter 12 : Wireless Local Area Networks
224. According to the PPP transition state diagram, options are negotiated in the _____ state.
a. Networking
b. Terminating
c. Establishing
d. Authenticating
The correct **answer** is c

225. According to the PPP transition state diagram, verification of user identification occurs in the _____ state.
a. Networking
b. Terminating
c. Establishing
d. Authenticating
The correct **answer** is d

226. PAP requires _____ and _____ from the user.
a. A password; a calculated value
b. Authentication identification; a calculated value
c. Authentication identification; a password
d. A challenge value; a password
The correct **answer** is c

227. According to the PPP transition state diagram, the link is disconnected in the _____ state.
a. Networking
b. Terminating
c. Establishing
d. Authenticating
The correct **answer** is b

228. In the PPP frame, the _____ field defines the contents of the data field.
a. FCS
b. Flag
c. Control
d. Protocol
The correct **answer** is d

229. According to the PPP transition state diagram, exchange of user control and data packets occurs in the _____ state.
a. Networking
b. Terminating
c. Establishing
d. Authenticating
The correct **answer** is a

230. _____, an (a)_____ protocol, establishes and terminates a network layer connection for IP packets.
a. CHAP; NCP
b. IPCP; NCP
c. NCP; IPCP
d. SLIP; PPP
The correct **answer** is b

231. In the PPP frame, the _____ field is similar to that of the U-frame in HDLC.
a. Flag
b. Protocol
c. FCS
d. Control
The correct **answer** is d

232. In the PPP frame, the _____ field has a value of 11111111 to indicate the broadcast address of HDLC.
a. Protocol
b. Address
c. Control
d. FCS
The correct **answer** is b

233. What is the purpose of LCP packets?
a. Configuration
b. Termination
c. Option negotiation
d. All the above

The correct **answer** is d

234. _____ is a three-way handshake for user verification.
a. PPP
b. CHAP
c. PAP
d. (b) and (c)
The correct **answer** is b

235. A PAP packet and a CHAP packet can be distinguished by the value of the _____ field of the PPP frame.
a. Protocol
b. FCS
c. Address
d. Control
The correct **answer** is d

236. In the PPP frame, the _____ field is for error control.
a. FCS
b. Flag
c. Control
d. Protocol
The correct **answer** is a

237. CHAP authentication, the user takes the system's _____ and its own _____ to create a result that is then sent to the system.
a. Authentication identification; password
b. Password; authentication identification
c. Challenge value; password
d. Password; challenge value
The correct **answer** is c

238. If an FDMA network has eight stations, the medium bandwidth has _____ bands.
a. 1
b. 2
c. 8
d. 16
The correct **answer** is c

239. In the _____ random-access method there is no collision.
a. CSMA/CD
b. CSMA/CA
c. ALOHA
d. Token-passing
The correct **answer** is b

240. In the 1-persistent approach, when a station finds an idle line, it _____.
a. Sends immediately
b. Waits 0.1 s before sending
c. Waits 1 s before sending
d. Waits a time equal to 1 - p before sending
The correct **answer** is a

241. _____ requires one primary station and one or more secondary stations.
a. Token ring
b. Reservation
c. Polling
d. CSMA
The correct **answer** is c

242. In the p-persistent approach, when a station finds an idle line, it _____.
a. Sends immediately
b. Waits 1 s before sending

c. Sends with probability 1 - p
d. Sends with probability p
The correct **answer** is d

243. A network using the CSMA random-access method with p equal to 0.25 will send _____ percent of the time after accessing an idle line.
a. 50
b. 75
c. 100
d. 25
The correct **answer** is d

244. The 1-persistent approach can be considered a special case of the p-persistent approach with p equal to _____.
a. 1.0
b. 2.0
c. 0.1
d. 0.5
The correct **answer** is a

245. _____ is a random-access protocol.
a. FDMA
b. CDMA
c. MA
d. Polling
The correct **answer** is c

246. In the reservation access method, if there are 10 stations on a network, then there are _____ reservation minislots in the reservation frame.
a. 10
b. 11
c. 5
d. 9
The correct **answer** is a

247. A Walsh table for 16 stations has a chip sequence of _____ chips.
a. 16
b. 32
c. 4
d. 8
The correct **answer** is a

248. _____ is a controlled-access protocol.
a. FDMA
b. TDMA
c. CSMA
d. Reservation
The correct **answer** is d

249. _____ is (are) a channelization protocol.
a. FDMA
b. TDMA
c. CDMA
d. All the above
The correct **answer** is d

250. _____ is the access protocol used by traditional Ethernet.
a. Token ring
b. CSMA
c. CSMA/CD
d. CSMA/CA
The correct **answer** is c

251. The most primitive random access method is _____.
a. Channelization
b. ALOHA
c. CSMA
d. Token passing
The correct **answer** is b

252. When a collision is detected in a network using CSMA/CD, _____.
a. The frame is immediately resent
b. The backoff value is decremented by 1
c. A jam signal is sent by the station
d. The backoff value is set to 0
The correct **answer** is c

253. In the _____ random-access method, stations do not sense the medium.
a. CSMA/CA
b. ALOHA
c. CSMA/CD
d. Ethernet
The correct **answer** is b

254. When a primary device asks a secondary device if it has data to send, this is called _____.
a. Backing off
b. Polling
c. Selecting
d. Reserving
The correct **answer** is b

255. If a TDMA network has eight stations, the medium bandwidth has _____ bands.
a. 1
b. 2
c. 8
d. 16
The correct **answer** is a

256. If a CDMA network has eight stations, the medium bandwidth has _____ bands.
a. 1
b. 2
c. 8
d. 16
The correct **answer** is a

257. If an Ethernet destination address is 08-07-06-05-44-33, then this is a _____ address.
a. Broadcast
b. Unicast
c. Multicast
d. Any of the above
The correct **answer** is b

258. What is the hexadecimal equivalent of the Ethernet address 01011010 00010001 01010101 00011000 10101010 00001111?
a. 5A-11-55-18-AA-0F
b. 5A-88-AA-18-55-F0
c. 5A-81-BA-81-AA-0F
d. 5A-18-5A-18-55-0F
The correct **answer** is a

259. Which of the following could not be an Ethernet source address?
a. 8A-7B-6C-DE-10-00
b. 8B-32-21-21-4D-34
c. EE-AA-C1-23-45-32
d. 46-56-21-1A-DE-F4

The correct **answer** is b

260. What is the efficiency of 4B/5B block encoding?
a. 60 percent
b. 80 percent
c. 20 percent
d. 40 percent

The correct **answer** is b

261. Which of the following could not be an Ethernet unicast destination?
a. 44-AA-C1-23-45-32
b. 46-56-21-1A-DE-F4
c. 48-32-21-21-4D-34
d. 43-7B-6C-DE-10-00

The correct **answer** is d

262. What is the efficiency of 8B/10B encoding?
a. 80 percent
b. 20 percent
c. 40 percent
d. 60 percent

The correct **answer** is a

263. A 10-station Ethernet LAN uses a _____-port bridge if the effective average data rate for each station is 2 Mbps.
a. 10
b. 1
c. 2
d. 5

The correct **answer** is d

264. A _____-station Ethernet LAN uses a four-port bridge. Each station has an effective average data rate of 1.25 Mbps.
a. 160
b. 80
c. 40
d. 32

The correct **answer** is d

265. An 80-station traditional Ethernet is divided into four collision domains. This means that a maximum of _____ stations contend for medium access at any one time.
a. 20
b. 76
c. 80
d. 320

The correct **answer** is a

266. If an Ethernet destination address is 07-01-02-03-04-05, then this is a _____ address.
a. Unicast
b. Broadcast
c. Multicast
d. Any of the above

The correct **answer** is c

267. What is the efficiency of a frame in half-duplex Gigabit Ethernet carrying 46 bytes of data?
a. 97 percent
b. 70 percent
c. 56 percent
d. 12 percent

The correct **answer** is b

268. Which of the following could not be an Ethernet multicast destination?
a. B7-7B-6C-DE-10-00
b. 7C-56-21-1A-DE-F4

c. 7B-AA-C1-23-45-32
d. 83-32-21-21-4D-34
The correct **answer** is b

269. Which of the following is a four-wire Gigabit Ethernet implementation?
a. 1000Base-SX
b. 1000Base-LX
c. 1000Base-T
d. 1000Base-CX
The correct **answer** is c

270. Forty stations are on an Ethernet LAN. A 10-port bridge segments the LAN. What is the effective average data rate of each station?
a. 1.0 Mbps
b. 2.5 Mbps
c. 2.0 Mbps
d. 5.0 Mbps
The correct **answer** is b

271. A wireless LAN using FHSS hops 10 times per cycle. If the bandwidth of the original signal is 10 MHz and 2 GHz is the lowest frequency, the highest frequency of the system is _____ GHz.
a. 1.0
b. 2.0
c. 2.1
d. 3.0
The correct **answer** is c

272. An FHSS wireless LAN has a spread spectrum of 1 GHz. The bandwidth of the original signal is 250 MHz, and there are _____ hops per cycle.
a. 4
b. 3
c. 2
d. 1
The correct **answer** is a

273. A wireless LAN using FHSS hops 10 times per cycle. If the bandwidth of the original signal is 10 MHz, the spread spectrum is _____ MHz.
a. 1000
b. 10,000
c. 10
d. 100
The correct **answer** is d

274. A wireless LAN using DSSS with an 8-bit chip code needs _____ MHz for sending data that originally required a 10-MHz bandwidth.
a. 20
b. 80
c. 2
d. 8
The correct **answer** is b

275. A wireless LAN using DSSS with _____-bit chip code needs 320 MHz for sending data that originally required a 20-MHz bandwidth.
a. A 2
b. A 16
c. A 32
d. An 8
The correct **answer** is b

276. A wireless LAN using DSSS with a 4-bit chip code needs 10 MHz for sending data that originally required a _____-MHz bandwidth.
a. 20

b. 25
c. 40
d. 2.5
The correct **answer** is d

277. In an ESS the _____ station is not mobile.
a. BSS
b. AP
c. Server
d. None of the above
The correct **answer** is b

278. In an ESS the _____ stations are part of a wired LAN.
a. BSS
b. AP
c. Server
d. All the above
The correct **answer** is b

279. A station with _____ mobility is either stationary or moving only inside a BSS.
a. No-transition
b. BSS
c. ESS
d. (a) and (b)
The correct **answer** is a

280. _____ combine to form a scatternet.
a. APs
b. Piconets
c. BSSs
d. ESSs
The correct **answer** is b

281. Bluetooth uses _____ in the physical layer.
a. DSSS
b. DHSS
c. FHSS
d. OFDM
The correct **answer** is c

282. A _____ frame usually precedes a CTS frame.
a. SIFS
b. RTS
c. DIFS
d. Any of the above
The correct **answer** is b

283. A station with _____ mobility can move from one BSS to another.
a. No-transition
b. ESS-transition
c. BSS-transition
d. (b) and (c)
The correct **answer** is c

284. A station with _____ mobility can move from one ESS to another.
a. No-transition
b. ESS-transition
c. BSS-transition
d. (b) and (c)
The correct **answer** is b

285. A _____ frame usually precedes an RTS frame.

a. DIFS
b. CIFS
c. CTS
d. None of the above
The correct **answer** is d

286. Wireless transmission is _____ prone to error than/as wired transmission.
a. Less
b. More
c. Half as
d. None of the above
The correct **answer** is b

287. Which MAC sublayer does IEEE 802.11 define?
a. LLC
b. PCF
c. DCF
d. (b) and (c)
The correct **answer** is d

288. What is the basic access method for wireless LANs as defined by IEEE 802.11?
a. LLC
b. PCF
c. DCF
d. BFD
The correct **answer** is c

289. The access method for wireless LANs as defined by IEEE 802.11 is based on _____.
a. Token passing
b. CSMA
c. CSMA/CD
d. CSMA/CA
The correct **answer** is d

290. FHSS, DSSS, and OFDM are _____ layer specifications.
a. Data link
b. Network
c. Physical
d. Transport
The correct **answer** is c

291. Stations do not sense the medium during _____ time.
a. SIFS
b. NAV
c. RTS
d. CTS
The correct **answer** is b

292. A Bluetooth frame needs _____ μs for hopping and control mechanisms.
a. 3
b. 625
c. 259
d. A multiple of 259
The correct **answer** is c

293. In the _____ method, the sender hops from frequency to frequency in a specific order.
a. DSSS
b. FHSS
c. OFDM
d. HR-DSSS
The correct **answer** is b

294. A wireless LAN uses _____ frames for acknowledgment.
a. Management
b. Data
c. Control
d. None of the above
The correct **answer** is c

295. A wireless LAN uses _____ frames for the initial communication between stations and the access points.
a. Control
b. Data
c. Management
d. None of the above
The correct **answer** is c

296. A Bluetooth network can have _____ master(s).
a. One
b. Two
c. Three
d. Eight
The correct **answer** is a

297. A bridge forwards or filters a frame by comparing the information in its address table to the frame's _____.
a. Source node's physical address
b. Layer 2 destination address
c. Layer 2 source address
d. Layer 3 destination address
The correct **answer** is b

298. Repeaters function in the _____ layer(s).
a. Network
b. Physical (MAC)
c. Data link
d. (a) and (b)
The correct **answer** is b

299. A _____ is actually a multiport repeater.
a. Hub
b. Bridge
c. Router
d. VLAN
The correct **answer** is a

300. A repeater takes a weakened or corrupted signal and _____ it.
a. Resamples
b. Reroutes
c. Amplifies
d. Regenerates
The correct **answer** is d

301. A bridge has access to the _____ address of a station on the same network.
a. Network
b. Service access point
c. Physical (MAC)
d. All the above
The correct **answer** is c

302. The bridge with the least-cost path between the LAN and the root bridge is called the _____ bridge.
a. Forwarding
b. Designated
c. Blocking
d. (a) and (b)
The correct **answer** is b

303. A system with redundant bridges might have a problem with _____ in the system.
a. Filters
b. Spanning trees
c. Loops
d. All the above
The correct **answer** is c

304. Bridges function in the _____ layer(s).
a. Physical (MAC)
b. Data link
c. Network
d. (a) and (b)
The correct **answer** is d

305. In a VLAN, stations are separated into groups by _____.
a. Software methods
b. Location
c. Physical methods
d. Switches
The correct **answer** is a

306. A bridge can _____.
a. Filter a frame
b. Forward a frame
c. Extend a LAN
d. Do all the above
The correct **answer** is d

307. A _____ bridge has the smallest ID.
a. Designated
b. Forwarding
c. Blocking
d. Root
The correct **answer** is d

308. A bridge never forwards frames out of the _____ port.
a. Root
b. Designated
c. Blocking
d. Forwarding
The correct **answer** is c

309. Which type of bridge builds and updates its tables from address information on frames?
a. Transparent
b. Simple
c. (a) and (b)
d. None of the above
The correct **answer** is a

310. VLAN technology divides a LAN into _____ groups.
a. Multiplexed
b. Framed
c. Physical
d. Logical
The correct **answer** is d

311. Which of the following is a connecting device?
a. Bridge
b. Repeater
c. Hub
d. All the above

The correct **answer** is d

312. Which station characteristic can be used to group stations into a VLAN?
a. Port numbers
b. MAC addresses
c. IP addresses
d. All the above
The correct **answer** is d

313. _____ is a first-generation cellular phone system.
a. GSM
b. IS-95
c. AMPS
d. D-AMPS
The correct **answer** is c

314. AMPS uses _____ for modulation.
a. FM
b. FSK
c. PM
d. (a) and (b)
The correct **answer** is d

315. _____ separates the AMPS voice channels.
a. CDMA
b. TDMA
c. FDMA
d. (b) and (c)
The correct **answer** is c

316. _____ is a cellular telephone system popular in Europe.
a. GSM
b. D-AMPS
c. IS-95
d. AMPS
The correct **answer** is a

317. D-AMPS uses _____ for multiplexing.
a. CDMA
b. TDMA
c. FDMA
d. (b) and (c)
The correct **answer** is d

318. GSM uses _____ for multiplexing.
a. CDMA
b. TDMA
c. FDMA
d. (b) and (c)
The correct **answer** is d

319. DSSS is used by the _____ cellular phone system.
a. AMPS
b. IS-95
c. D-AMPS
d. GSM
The correct **answer** is b

320. _____ base stations use GPS for synchronization.
a. GSM
b. IS-95
c. AMPS

d. D-AMPS

The correct **answer** is b

321. _____ will have 288 satellites in 12 polar orbits.
a. Teledesic
b. Globalstar
c. Iridium
d. GPS

The correct **answer** is a

322. IS-95 has a frequency reuse factor of _____.
a. 7
b. 95
c. 1
d. 5

The correct **answer** is c

323. The path that a satellite makes around the world is called _____.
a. An orbit
b. A period
c. A footprint
d. An uplink

The correct **answer** is a

324. A GEO satellite has _____ orbit.
a. A polar
b. An inclined
c. An equilateral
d. An equatorial

The correct **answer** is d

325. Which orbit has the highest altitude?
a. LEO
b. GEO
c. MEO
d. HEO

The correct **answer** is b

326. _____ is a second-generation cellular phone system.
a. D-AMPS
b. GSM
c. IS-95
d. All the above

The correct **answer** is d

327. A _____ is a computerized center that is responsible for connecting calls, recording call information, and billing.
a. Cell
b. Mobile station
c. Base station
d. Mobile switching center

The correct **answer** is d

328. _____ has 48 satellites in six polar orbits.
a. Iridium
b. Teledesic
c. Globalstar
d. GPS

The correct **answer** is c

329. The signal from a satellite is aimed at a specific area called the _____.
a. Orbit
b. Period

c. Footprint
d. Uplink
The correct **answer** is c

330. In _____, a mobile station always communicates with just one base station.
a. Roaming
b. A roaming handoff
c. A hard handoff
d. A soft handoff
The correct **answer** is c

331. MEO satellites orbit _____ Van Allen belts.
a. In the
b. Above both
c. Below both
d. Between the
The correct **answer** is d

332. _____ is often used for navigation purposes.
a. GPS
b. AMPS
c. IS-95
d. Iridium
The correct **answer** is a

333. An LEO satellite has _____ orbit.
a. An equatorial
b. A polar
c. An inclined
d. All the above
The correct **answer** is b

334. Teledesic is a _____ LEO satellite system.
a. Passband
b. Broadband
c. Little
d. Big
The correct **answer** is b

335. _____ has 66 satellites in six LEOs.
a. Globalstar
b. Teledesic
c. GPS
d. Iridium
The correct **answer** is d

336. Transmission from the Earth to the satellite is called the _____.
a. Downlink
b. Uplink
c. Footlink
d. Up print
The correct **answer** is b

337. The _____ is not used for voice communication.
a. GPS
b. Iridium system
c. IS-95 system
d. Globalstar system
The correct **answer** is a

338. _____ is a Frame Relay option that transmits voice through the network.
a. LMI

b. FRAD
c. VOFR
d. DLCI
The correct **answer** is c

339. Frame Relay provides _____ connections.
a. PVC
b. SVC
c. (a) and (b)
d. None of the above
The correct **answer** is c

340. Routing and switching in Frame Relay are performed by the _____ layer.
a. Physical
b. Network
c. Data link
d. (b) and (c)
The correct **answer** is c

341. Frame Relay is unsuitable for _____ due to possible delays in transmission resulting from variable frame sizes.
a. File transfers
b. Real-time video
c. Fixed-rate data communication
d. All the above
The correct **answer** is b

342. The Frame Relay address field is _____ in length.
a. 4 bytes
b. 2 bytes
c. 3 bytes
d. Any of the above
The correct **answer** is d

343. Because ATM _____, which means that cells follow the same path, the cells do not usually arrive out of order.
a. Is asynchronous
b. Uses virtual circuit routing
c. Is multiplexed
d. Is a network
The correct **answer** is b

344. _____ is a protocol to control and manage interfaces in Frame Relay networks.
a. FRAD
b. DLCI
c. LMI
d. VOFR
The correct **answer** is c

345. Frame Relay operates in the _____.
a. Physical and data link layers
b. Physical, data link, and network layers
c. Physical layer
d. Data link layer
The correct **answer** is a

346. In the data link layer, Frame Relay uses _____.
a. A simplified HDLC protocol
b. LAPB
c. BSC protocol
d. Any ANSI standard protocol
The correct **answer** is a

347. The VPI of an NNI is _____ bits in length.

a. 16
b. 8
c. 12
d. 24
The correct **answer** is c

348. In data communications, ATM is an acronym for _____.
a. Automated Teller Machine
b. Automatic Transmission Model
c. Asynchronous Transfer Mode
d. Asynchronous Telecommunication Method
The correct **answer** is c

349. Which AAL type is designed to support SEAL?
a. AAL1
b. AAL2
c. AAL3/4
d. AAL5
The correct **answer** is d

350. Which layer in ATM protocol reformats the data received from other networks?
a. Physical
b. Application adaptation
c. Data adaptation
d. ATM
The correct **answer** is b

351. Which layer in ATM protocol has a 53-byte cell as an end product?
a. ATM
b. Application adaptation
c. Physical
d. Cell transformation
The correct **answer** is a

352. Which AAL type is designed to support a data stream that has a constant bit rate?
a. AAL1
b. AAL2
c. AAL3/4
d. AAL5
The correct **answer** is a

353. The VPI of a UNI is _____ bits in length.
a. 12
b. 16
c. 24
d. 8
The correct **answer** is d

354. In an ATM network, all cells belonging to a single message follow the same _____ and remain in their original order until they reach their destination.
a. Virtual circuit
b. Transmission path
c. Virtual path
d. None of the above
The correct **answer** is a

355. A device called a(n) _____ allows frames from an ATM network to be transmitted across a Frame Relay network.
a. FRAD
b. LMI
c. VOFR
d. DLCI
The correct **answer** is a

356. A _____ provides a connection or a set of connections between switches.
a. Transmission path
b. Virtual circuit
c. Virtual path
d. None of the above
The correct **answer** is b

357. A _____ is the physical connection between an endpoint and a switch or between two switches.
a. Virtual path
b. Transmission path
c. Virtual circuit
d. None of the above
The correct **answer** is b

358. On a network that uses NAT, the _____ has a translation table.
a. Router
b. Switch
c. Server
d. None of the above
The correct **answer** is a

359. Identify the class of IP address 229.1.2.3.
a. Class A
b. Class B
c. Class C
d. Class D
The correct **answer** is d

360. On a network that uses NAT, _____ initiates the communication.
a. An internal host
b. An external host
c. The router
d. (a) or (b)
The correct **answer** is a

361. A subnet mask in class B can have _____ 1s with the remaining bits 0s.
a. Nine
b. Seventeen
c. Three
d. Fourteen
The correct **answer** is b

362. A subnet mask in class C can have _____ 1s with the remaining bits 0s.
a. Twenty-five
b. Twelve
c. Seven
d. Ten
The correct **answer** is a

363. Identify the class of IP address 4.5.6.7.
a. Class A
b. Class B
c. Class C
d. Class D
The correct **answer** is a

364. Identify the class of IP address 191.1.2.3.
a. Class A
b. Class B
c. Class C
d. Class D

The correct **answer** is b

365. A subnet mask in class A can have _____ 1s with the remaining bits 0s.
a. Nine
b. Four
c. Thirty-three
d. Three

The correct **answer** is a

366. Class _____ has the greatest number of hosts per given network address.
a. A
b. B
c. C
d. D

The correct **answer** is a

367. A subnet mask in class B has nineteen 1s. How many subnets does it define?
a. 128
b. 8
c. 32
d. 64

The correct **answer** is b

368. In _____ routing, the full IP address of a destination is given in the routing table.
a. Next-hop
b. Host-specific
c. Network-specific
d. Default

The correct **answer** is b

369. A subnet mask in class C has twenty-five 1s. How many subnets does it define?
a. 0
b. 2
c. 8
d. 16

The correct **answer** is b

370. Given the IP address 180.25.21.172 and the subnet mask 255.255.192.0, what is the subnet address?
a. 180.25.21.0
b. 180.25.8.0
c. 180.25.0.0
d. 180.0.0.0

The correct **answer** is c

371. Given the IP address 18.250.31.14 and the subnet mask 255.240.0.0, what is the subnet address?
a. 18.9.0.14
b. 18.0.0.14
c. 18.31.0.14
d. 18.240.0.0

The correct **answer** is d

372. _____ is a client-server program that provides an IP address, subnet mask, IP address of a router, and IP address of a name server to a computer.
a. NAT
b. DHCP
c. CIDR
d. ISP

The correct **answer** is b

373. In _____, each packet of a message need not follow the same path from sender to receiver.
a. The virtual approach to packet switching
b. The datagram approach to packet switching

c. Message switching
d. None of the above
The correct **answer** is b

374. An IP address consists of _____ bits.
a. 8
b. 32
c. 4
d. Any of the above
The correct **answer** is b

375. On a network that uses NAT, the router can use _____ global address(es).
a. A pool of
b. One
c. Two
d. None of the above
The correct **answer** is a

376. In _____ routing, the mask and destination addresses are both 0.0.0.0 in the routing table.
a. Default
b. Next-hop
c. Network-specific
d. Host-specific
The correct **answer** is a

377. A subnet mask in class A has fourteen 1s. How many subnets does it define?
a. 64
b. 128
c. 32
d. 8
The correct **answer** is a

378. In which type of switching do all the packets of a message follow the same channels of a path?
a. Virtual circuit packet switching
b. Message switching
c. Datagram packet switching
d. None of the above
The correct **answer** is a

379. In _____ routing, the destination address is a network address in the routing table.
a. Network-specific
b. Host-specific
c. Next-hop
d. Default
The correct **answer** is a

380. Given the IP address 201.14.78.65 and the subnet mask 255.255.255.224, what is the subnet address?
a. 201.14.78.64
b. 201.14.78.32
c. 201.14.78.65
d. 201.14.78.12
The correct **answer** is a

381. In error reporting the encapsulated ICMP packet goes to _____.
a. The receiver
b. A router
c. The sender
d. Any of the above
The correct **answer** is c

382. When the hop-count field reaches zero and the destination has not been reached, a _____ error message is sent.
a. Destination-unreachable

b. Redirection
c. Time-exceeded
d. Parameter-problem
The correct **answer** is c

383. An ARP request is _____ to _____.
a. Multicast; one host
b. Unicast; all hosts
c. Broadcast; all hosts
d. Unicast; one host
The correct **answer** is c

384. What is the maximum size of the data portion of the IP datagram?
a. 65,515 bytes
b. 65,535 bytes
c. 65,475 bytes
d. 65,460 bytes
The correct **answer** is a

385. A best-effort delivery service such as IP does not include _____.
a. Error correction
b. Error checking
c. Datagram acknowledgment
d. All the above
The correct **answer** is d

386. An HLEN value of decimal 10 means _____.
a. There is 10 bytes of options
b. There is 40 bytes in the header
c. There is 40 bytes of options
d. There is 10 bytes in the header
The correct **answer** is b

387. In IPv4, what is the value of the total length field in bytes if the header is 28 bytes and the data field is 400 bytes?
a. 407
b. 107
c. 428
d. 427
The correct **answer** is c

388. If the fragment offset has a value of 100, it means that _____.
a. The first byte of the datagram is byte 800
b. The datagram has not been fragmented
c. The datagram is 100 bytes in size
d. The first byte of the datagram is byte 100
The correct **answer** is a

389. What is needed to determine the number of the last byte of a fragment?
a. Identification number
b. Offset number
c. Total length
d. (b) and (c)
The correct **answer** is d

390. The IP header size _____.
a. Depends on the MTU
b. Is 20 to 60 bytes long
c. Is 20 bytes long
d. Is 60 bytes long
The correct **answer** is b

391. If a host needs to synchronize its clock with another host, it sends a _____ message.

a. Time-exceeded
b. Time-stamp-request
c. Source-quench
d. Router-advertisement
The correct **answer** is b

392. Which of the following is a necessary part of the IPv6 datagram?
a. Base header
b. Extension header
c. Data packet from the upper layer
d. (a) and (c)
The correct **answer** is d

393. _____ is a dynamic mapping protocol in which a physical address is found for a given IP address.
a. RARP
b. ICMP
c. ARP
d. None of the above
The correct **answer** is c

394. A router reads the _____ address on a packet to determine the next hop.
a. MAC
b. Source
c. IP
d. ARP
The correct **answer** is c

395. The target hardware address on an Ethernet is _____ in an ARP request.
a. Variable
b. Class-dependent
c. 0x000000000000
d. 0.0.0.0
The correct **answer** is c

396. When not all fragments of a message have been received within the designated amount of time, a _____ error message is sent.
a. Time-exceeded
b. Parameter-problem
c. Source-quench
d. Time-stamp-request
The correct **answer** is a

397. A _____ can learn about network _____ by sending out a router-solicitation packet.
a. Router; routers
b. Router; hosts
c. Host; routers
d. Host; hosts
The correct **answer** is c

398. Which of the following types of ICMP messages needs to be encapsulated into an IP datagram?
a. Time-exceeded
b. Multicasting
c. Echo reply
d. All the above
The correct **answer** is d

399. The purpose of echo request and echo reply is to _____.
a. Report errors
b. Check packet lifetime
c. Check node-to-node communication
d. Find IP addresses
The correct **answer** is c

400. An ARP reply is _____ to _____.
a. Unicast; one host
b. Broadcast; all hosts
c. Multicast; one host
d. Unicast; all hosts
The correct **answer** is a

401. One method to alert a source host of congestion is the _____ message.
a. Source-quench
b. Redirection
c. Echo-request
d. Destination-unreachable
The correct **answer** is a

402. A time-exceeded message is generated if _____.
a. The round-trip time between hosts is close to zero
b. The time-to-live field has a zero value
c. Fragments of a message do not arrive within a set time
d. (b) and (c)
The correct **answer** is d

403. To determine whether a node is reachable, _____ message can be sent.
a. An echo-request
b. An echo-reply
c. A redirection
d. A source-quench
The correct **answer** is a

404. In IPv6, the _____ field in the base header restricts the lifetime of a datagram.
a. Version
b. Hop limit
c. Priority
d. Next-header
The correct **answer** is b

405. In IPv4, what is the length of the data field given an HLEN value of 12 and total length value of 40,000?
a. 39,952
b. 39,988
c. 40,012
d. 40,048
The correct **answer** is a

406. A datagram is fragmented into three smaller datagrams. Which of the following is true?
a. The do not fragment bit is set to 1 for all three datagrams.
b. The identification field is the same for all three datagrams.
c. The more fragment bit is set to 0 for all three datagrams.
d. The offset field is the same for all three datagrams.
The correct **answer** is b

407. Errors in the header or option fields of an IP datagram require a _____ error message.
a. Source-quench
b. Parameter-problem
c. Router-solicitation
d. Redirection
The correct **answer** is b

408. The cost field of a router's first table from itself always has a value of _____.

a. Some positive integer
b. 0
c. 1

d. Infinity

The correct **answer** is b

409. A routing table contains _____.
a. The destination network ID
b. The hop count to reach the network
c. The router ID of the next hop
d. All the above

The correct **answer** is d

410. Router B receives an update from router A that indicates Net1 is two hops away. The next update from A says Net1 is five hops away. What value is entered in B's routing table for Net1? Assume the basic RIP is being used.
a. 6
b. 7
c. 2
d. 3

The correct **answer** is a

411. If the routing table contains four new entries, how many update messages must the router send to its one neighbor router?
a. 3
b. 4
c. 1
d. 2

The correct **answer** is c

412. An area border router can be connected to _____.
a. Only another router
b. Only another network
c. Only another area border router
d. Another router or another network

The correct **answer** is d

413. Which of the following usually has the least number of connections to other areas?
a. A transient link
b. A stub link
c. An area
d. An autonomous system

The correct **answer** is b

414. _____ is used in a dense multicast environment while _____ is used in a sparse multicast environment.
a. PIM-SM; PIM-DM
b. PIM; PIM-DM
c. PIM; PIM-SM
d. PIM-DM; PIM-SM

The correct **answer** is d

415. When a multicast router is not directly connected to another multicast router, a _____ can be formed to connect the two.
a. Logical core
b. Spanning tree
c. Physical tunnel
d. Logical tunnel

The correct **answer** is d

416. Which type of network using the OSPF protocol can have five routers attached to it?
a. Transient
b. Stub
c. Point-to-point
d. All the above

The correct **answer** is a

417. A WAN using the OSPF protocol that connects two routers is an example of a _____ type of OSPF network.
a. Stub

b. Point-to-point
c. Transient
d. Virtual
The correct **answer** is b

418. If four hosts on a network belong to the same group, a total of _____ sent in
a. One membership report is
b. Two membership reports are
c. Three membership reports are
d. Four membership reports are
The correct **answer** is b

419. A one-to-all communication between a source and all hosts on a network is classified as a _____ communication.
a. Unicast
b. Multicast
c. Broadcast
d. (a) and (b)
The correct **answer** is c

420. Which type of BGP message announces a route to a new destination?
a. Update
b. Open
c. Keep-alive
d. Notification
The correct **answer** is a

421. Which layer produces the OSPF message?
a. Data link
b. Transport
c. Application
d. Network
The correct **answer** is d

422. Which of the following is an exterior routing protocol?
a. RIP
b. OSPF
c. BGP
d. (a) and (b)
The correct **answer** is c

423. An area is _____.
a. Composed of at least two ASs
b. Another term for an internet
c. Part of an AS
d. A collection of stub areas
The correct **answer** is c

424. In an autonomous system with n areas, how many areas are connected to the backbone?
a. 1
b. n
c. n – 1
d. n + 1
The correct **answer** is c

425. Which of the following is an interior routing protocol?
a. RIP
b. OSPF
c. BGP
d. (a) and (b)
The correct **answer** is d

426. OSPF is based on _____.

a. Distance vector routing
b. Path vector routing
c. Link state routing
d. (a) and (b)
The correct **answer** is c

427. BGP is based on _____.
a. Distance vector routing
b. Link state routing
c. Path vector routing
d. (a) and (b)
The correct **answer** is c

428. Which type of BGP message creates a relationship between two routers?
a. Keep-alive
b. Open
c. Update
d. Notification
The correct **answer** is b

429. Which type of network using the OSPF protocol always consists of just two connected routers?
a. Transient
b. Stub
c. Point-to-point
d. Virtual
The correct **answer** is c

430. Which type of network using the OSPF protocol is the result of a break in a link between two routers?
a. Virtual
b. Point-to-point
c. Transient
d. Stub
The correct **answer** is a

431. Which type of BGP message is sent by a router to close a connection?
a. Open
b. Update
c. Notification
d. Keep-alive
The correct **answer** is c

432. An IGMP query is sent from a _____ to a _____.
a. Router; host or router
b. Host; host
c. Host; router
d. Router; router
The correct **answer** is a

433. Which type of BGP message is sent by a system to notify another router of the sender's existence?
a. Keep-alive
b. Notification
c. Open
d. Update
The correct **answer** is a

434. An Ethernet LAN using the OSPF protocol with five attached routers can be called a _____ network.
a. Point-to-point
b. Stub
c. Transient
d. Virtual
The correct **answer** is c

435. In distance vector routing each router receives information directly from _____.
a. Its neighbors only
b. Every router on the network
c. Every router less than two units away
d. A table stored by the network hosts
The correct **answer** is a

436. A system uses group-shared trees for multicasting. If there are 100 sources and 5 groups, there is a maximum of _____ different trees.
a. 20
b. 100
c. 5
d. 500
The correct **answer** is c

437. _____ is a multicast routing protocol using source-based trees.
a. DVRMP
b. MOSPF
c. CBT
d. (a) and (b)
The correct **answer** is d

438. Pruning and grafting are strategies used in _____.
a. RPM
b. RPF
c. RPB
d. All the above
The correct **answer** is a

439. In distance vector routing a router sends out information _____.
a. Only when there is a change in its table
b. Only when a new host is added
c. At regularly scheduled intervals
d. Only when a new network is added
The correct **answer** is c

440. The _____ field of the IGMP message is all zeros in a query message.
a. Version
b. Type
c. Group address
d. Checksum
The correct **answer** is c

441. The _____ field of the IGMP message is 0x11 for a query message.
a. Version
b. Type
c. Checksum
d. d. (a) and (b)
The correct **answer** is d

442. A one-to-many communication between a source and a specific group of hosts is classified as a _____ communication.
a. Multicast
b. Unicast
c. Broadcast
d. (a) and (b)
The correct **answer** is a

443. A one-to-one communication between a source and one destination is classified as a _____ communication.
a. Unicast
b. Multicast
c. Broadcast
d. d. (a) and (b)

The correct **answer** is a

444. _____ is a multicasting application.
a. Teleconferencing
b. Distance learning
c. Information dissemination
d. All the above
The correct **answer** is d

445. A _____ is a data structure with nodes and edges and a hierarchical structure.
a. Graph
b. Leaf
c. Tree
d. Root
The correct **answer** is c

446. A system uses source-based trees for multicasting. If there are 100 sources and 5 groups, there is a maximum of _____ different trees.
a. 5
b. 20
c. 100
d. 500
The correct **answer** is d

447. In a _____ tree approach to multicasting, the combination of source and group determines the tree.
a. Shortest-group
b. Source-based
c. Spanning-source
d. Group-shared
The correct **answer** is b

448. In a _____ tree approach to multicasting, the group determines the tree.
a. Group-shared
b. Spanning-source
c. Shortest-group
d. Source-based
The correct **answer** is a

449. _____ is a multicast routing protocol using group-shared trees.
a. DVRMP
b. MOSPF
c. CBT
d. (a) and (b)
The correct **answer** is c

450. In _____ a network can receive a multicast packet from a particular source only through a designated parent router.
a. RPF
b. RPM
c. RPB
d. All the above
The correct **answer** is c

451. Dijkstra's algorithm is used to _____.
a. Create LSAs
b. Flood an internet with information
c. Create a link state database
d. Calculate the routing tables
The correct **answer** is d

452. A _____ message tells an upstream router to stop sending multicast messages for a specific group through a specific router.
a. Graft

b. Prune
c. Weed
d. Plum
The correct **answer** is b

453. The _____ is used by a router in response to a received-leave report.
a. Special query message
b. General query message
c. Membership report
d. Leave report
The correct **answer** is a

454. RIP is based on _____.
a. Link state routing
b. Dijkstra's algorithm
c. Path vector routing
d. Distance vector routing
The correct **answer** is d

455. A _____ message tells an upstream router to start sending multicast messages for a specific group through a specific router.
a. Weed
b. Prune
c. Plum
d. Graft
The correct **answer** is d

456. _____ uses multicast link state routing concepts to create source-based trees.
a. DVMRP
b. CBT
c. BVD
d. MOSPF
The correct **answer** is d

457. In the _____ protocol, a multicast packet is encapsulated inside a unicast packet with the core router as the destination.
a. DVMRP
b. CBT
c. MOSPF
d. BVD
The correct **answer** is b

458. The _____ is an IGMP message.
a. Query message
b. Membership report
c. Leave report
d. All the above
The correct **answer** is d

459. The _____ defines the client program.
a. Well-known port number
b. Ephemeral port number
c. IP address
d. Physical address
The correct **answer** is b

460. The _____ timer is used in the termination phase.
a. Retransmission
b. Time-waited
c. Persistence
d. Keep-alive
The correct **answer** is b

461. Which is a legal port address?
a. 0
b. 513
c. 65,535
d. All the above
The correct **answer** is d

462. The definition of reliable delivery includes _____.
a. Error-free delivery
b. Receipt of the complete message
c. In-order delivery
d. All the above
The correct **answer** is d

463. Which of the following does UDP guarantee?
a. Acknowledgments to the sender
b. Flow control
c. Sequence numbers on each user datagram
d. None of the above
The correct **answer** is d

464. The source port address on the UDP user datagram header defines _____.
a. The sending computer
b. The receiving computer
c. The application program on the receiving computer
d. The application program on the sending computer
The correct **answer** is d

465. A host can be identified by _____ while a program running on the host can be identified by _____.
a. A port number; an IP address
b. An IP address; a port number
c. An IP address; a host address
d. An IP address; a well-known port
The correct **answer** is b

466. Which of the following is not part of the UDP user datagram header?
a. Source port address
b. Checksum
c. Length of header
d. Destination port address
The correct **answer** is c

467. The _____ defines the server program.
a. IP address
b. Well-known port number
c. Ephemeral port number
d. Physical address
The correct **answer** is b

468. IP is responsible for _____ communication while TCP is responsible for _____ communication.
a. Process-to-process; node-to-node
b. Host-to-host; process-to-process
c. Process-to-process; host-to-host
d. Node-to-node; process-to-process
The correct **answer** is b

469. The _____ timer is needed to handle the zero window-size advertisement.
a. Persistence
b. Keep-alive
c. Retransmission
d. Time-waited
The correct **answer** is a

470. Connection establishment involves a _____ handshake.
a. Three-way
b. One-way
c. Two-way
d. None of the above
The correct **answer** is a

471. A special segment called a probe is sent by a sending TCP when the _____ timer goes off.
a. Persistence
b. Transmission
c. Keep-alive
d. Time-waited
The correct **answer** is a

472. The _____ address uniquely identifies a running application program.
a. IP address
b. NIC
c. Socket
d. Host
The correct **answer** is c

473. The _____ field is used to order packets of a message.
a. Sequence number
b. Acknowledgment number
c. Urgent pointer
d. Checksum
The correct **answer** is a

474. The _____ field is used for error detection.
a. Sequence number
b. Acknowledgment number
c. Urgent pointer
d. Checksum
The correct **answer** is d

475. Multiply the header length field by _____ to find the total number of bytes in the TCP header.
a. 4
b. 6
c. 8
d. 2
The correct **answer** is a

476. Urgent data require the urgent pointer field as well as the URG bit in the _____ field.
a. Sequence number
b. Control
c. Offset
d. Reserved
The correct **answer** is b

477. In _____, data are sent or processed at a very inefficient rate, such as 1 byte at a time.
a. Silly window syndrome
b. Sliding window syndrome
c. Nagle's syndrome
d. Delayed acknowledgment
The correct **answer** is a

478. The _____ timer keeps track of the time between the sending of a segment and the receipt of an acknowledgment.
a. Time-waited
b. Retransmission
c. Persistence
d. Keep-alive

The correct **answer** is b

479. To prevent silly window syndrome created by a receiver that processes data at a very slow rate, _____ can be used.
a. Clark's solution
b. Nagle's algorithm
c. Delayed acknowledgment
d. (a) or (c)
The correct **answer** is d

480. To prevent silly window syndrome created by a sender that sends data at a very slow rate, _____ can be used.
a. Nagle's algorithm
b. Clark's solution
c. Delayed acknowledgment
d. (a) or (c)
The correct **answer** is a

481. An ACK number of 1000 always means that _____.
a. 999 bytes has been successfully received
b. 1000 bytes has been successfully received
c. 1001 bytes has been successfully received
d. None of the above
The correct **answer** is d

482. The _____ timer prevents a long idle connection between two TCPs.
a. Keep-alive
b. Time-waited
c. Retransmission
d. Persistence
The correct **answer** is a

483. UDP and TCP are both _____ layer protocols.
a. Physical
b. Data link
c. Network
d. Transport
The correct **answer** is d

484. Which of the following functions does UDP perform?
a. End-to-end reliable data delivery
b. Process-to-process communication
c. Host-to-host communication
d. All the above
The correct **answer** is b

485. UDP needs the _____ address to deliver the user datagram to the correct application program.
a. Application
b. Internet
c. Physical
d. Port
The correct **answer** is d

486. Karn's algorithm is used in calculations by the _____ timer.
a. a. Time-waited
b. Retransmission
c. Persistence
d. Keep-alive
The correct **answer** is b

487. Slow start is used in conjunction with _____ as a TCP congestion control strategy.
a. Multiplicative increase
b. Multiplicative decrease

c. Additive increase
d. Additive decrease
The correct **answer** is c

488. The maximum length of time that traffic is generated at the peak rate is called the _____.
a. Effective bandwidth
b. Average data rate
c. Maximum burst size
d. Constant bit rate
The correct **answer** is c

489. For a system using TCP, the sender window size is determined by the _____ window size.
a. Receiver
b. Sender
c. Congestion
d. (a) and (c)
The correct **answer** is d

490. _____ traffic features sudden data rate changes in very short periods of time.
a. Constant-bit-rate
b. Bursty
c. Variable-bit-rate
d. Peak-bit-rate
The correct **answer** is b

491. When the load is greater than the capacity, the delay _____.
a. Decreases
b. Goes to infinity
c. Increases linearly
d. Goes to zero
The correct **answer** is b

492. _____ is a closed-loop mechanism to alleviate congestion.
a. A choke point
b. Implicit signaling
c. Explicit signaling
d. All the above
The correct **answer** is d

493. The FECN informs the _____ of congestion while the BECN informs the _____ of congestion.
a. Sender; destination
b. Interface; sender
c. Destination; interface
d. Destination; sender
The correct **answer** is d

494. The _____ is the maximum data rate of the traffic.
a. Average data rate
b. Maximum burst size
c. Effective bandwidth
d. Peak data rate
The correct **answer** is d

495. _____ is a flow characteristic in which the delay varies for packets belonging to the same flow.
a. Choke point
b. Additive increase
c. Jitter
d. Throughput
The correct **answer** is b

496. In _____ queuing the first packet into the queue is the first packet out of the queue.
a. Priority

b. Weighted fair
c. FIFO
d. LIFO
The correct **answer** is c

497. In Frame Relay the transmission rate can never exceed _____.
a. Bc
b. The access rate
c. Be
d. CIR
The correct **answer** is b

498. _____ measures the variation in cell transmission time.
a. SCR
b. CVDT
c. PCR
d. MCR
The correct **answer** is b

499. If the SCR is 60,000, the PCR is 70,000, and the MCR is 55,000, what is the minimum number of cells that can be sent per second?
a. 60,000
b. 70,000
c. 55,000
d. 5000
The correct **answer** is c

500. The _____ traffic shaping method gives a host credit for its idle time.
a. Leaky bucket
b. Traffic bucket
c. Token bucket
d. Bursty bucket
The correct **answer** is c

501. A flow-based QoS model designed for IP is called _____.
a. RSVP
b. Integrated Services
c. Differentiated Services
d. Multicast trees
The correct **answer** is b

502. A signaling protocol that helps IP create a flow is called _____.
a. RSVP
b. Integrated Services
c. Differentiated Services
d. Multicast trees
The correct **answer** is a

503. RSVP uses _____ messages.
a. Path
b. Resv
c. Resource
d. (a) and (b)
The correct **answer** is d

504. In an RSVP reservation style called _____ filter, the router creates a single reservation that can be shared by a set of flows.
a. Fixed
b. Shared explicit
c. Wild card
d. All the above
The correct **answer** is b

505. Differentiated Services was designed to handle the _____ problem associated with Integrated Services.
a. Stability
b. Reservation
c. Scalability
d. All the above
The correct **answer** is c

506. A _____ is a Differentiated Services traffic conditioner.
a. Meter
b. Marker
c. Shaper
The correct **answer** is c

507. What is the relationship between the access rate and the CIR?
a. CIR plus Be is equal to the access rate.
b. CIR is always equal to the access rate.
c. CIR is greater than the access rate.
d. CIR is less than the access rate.
The correct **answer** is d

508. If the maximum CTD is 10 μs and the minimum CTD is 1 μs, the _____ is 9 μs.
a. CDV
b. CLR
c. CTD
d. CER
The correct **answer** is a

509. A Frame Relay network is committed to transfer _____ bps without discarding any frames.
a. Be
b. Bc
c. CIR
d. (a) and (b)
The correct **answer** is b

510. The effective bandwidth is based on _____.
a. Average data rate
b. Peak data rate
c. Maximum burst size
d. All the above
The correct **answer** is d

511. The cell _____ is the difference between the CTD maximum and minimum.
a. Delay variation
b. Error ratio
c. Loss ratio
d. Transfer delay
The correct **answer** is a

512. The cell _____ is the ratio of lost cells to cells sent.
a. Delay variation
b. Error ratio
c. Loss ratio
d. Transfer delay
The correct **answer** is c

513. The _____ service class is particularly suitable for applications with bursty data.
a. CBR
b. ABR
c. VBR
d. UBR
The correct **answer** is b

514. The _____ service class is suitable for customers who need real-time video transmission without compression.
a. ABR
b. CBR
c. VBR
d. UBR
The correct **answer** is b

515. The _____ is greater than the SCR.
a. MCR
b. CVDT
c. PCR
d. All the above
The correct **answer** is c

516. The _____ is the fraction of the cells delivered in error.
a. CLR
b. CER
c. CTD
d. CDV
The correct **answer** is b

517. When added to Be, Bc should be less than the _____.
a. CIR
b. Committed burst size
c. Access rate
d. (a) and (b)
The correct **answer** is c

518. A connectionless iterative server uses _____ ports.
a. Well-known
b. Ephemeral
c. Active
d. (a) and (b)
The correct **answer** is a

519. The _____ socket is used with a protocol that directly uses the services of IP.
a. Raw
b. Stream
c. Datagram
d. Remote
The correct **answer** is a

520. A _____ server serves multiple clients, handling one request at a time.
a. Connectionless iterative
b. Connectionless concurrent
c. Connection-oriented iterative
d. Connection-oriented concurrent
The correct **answer** is a

521. A client issues _____ when it needs service from a server.
a. An active request
b. A finite open
c. An active open
d. A passive open
The correct **answer** is c

522. A _____ server serves multiple clients simultaneously.
a. Connectionless iterative
b. Connectionless concurrent
c. Connection-oriented iterative
d. Connection-oriented concurrent

The correct **answer** is d

523. The server program is _____ because it is always available, waiting for a client request.
a. Finite
b. Infinite
c. Active
d. Passive
The correct **answer** is b

524. A connection-oriented concurrent server uses _____ ports.
a. Well-known
b. Ephemeral
c. Active
d. (a) and (b)
The correct **answer** is d

525. Machine A requests service X from machine B. Machine B requests service Y from machine A. What is the total number of application programs required?
a. One
b. Two
c. Three
d. Four
The correct **answer** is d

526. A server program, once it issues _____, waits for clients to request its service.
a. An active request
b. A finite open
c. An active open
d. A passive open
The correct **answer** is d

527. _____ can request a service.
a. A socket interface
b. A client
c. A port
d. A server
The correct **answer** is b

528. _____ can provide a service.
a. An iterative server
b. A concurrent server
c. A client
d. (a) and (b)
The correct **answer** is d

529. The client program is _____ because it terminates after it has been served.
a. Finite
b. Infinite
c. Active
d. Passive
The correct **answer** is a

530. _____ processes requests one at a time.
a. An iterative server
b. A concurrent client
c. An iterative client
d. A concurrent server
The correct **answer** is a

531. The _____ socket is used with a connectionless protocol.
a. Raw
b. Stream

c. Datagram
d. Remote
The correct **answer** is c

532. _____ processes many requests simultaneously.
a. An iterative server
b. A concurrent client
c. An iterative client
d. A concurrent server
The correct **answer** is d

533. In a connection-oriented concurrent server, the _____ is used for connection only.
a. Well-known port
b. Infinite port
c. Ephemeral port
d. (b) and (c)
The correct **answer** is a

534. A _____ is an instance of a _____.
a. Program; process
b. Process; program
c. Process; service
d. Structure; process
The correct **answer** is b

535. The _____ socket is used with a connection-oriented protocol.
a. Raw
b. Stream
c. Datagram
d. Remote
The correct **answer** is b

536. In the string 219.46.123.107.in-addr.arpa, what is the network address of the host we are looking for?
a. 107.123.46.0
b. 107.0.0.0
c. 219.46.123.0
d. 107.123.0.0
The correct **answer** is b

537. In _____ resolution the client is in direct contact with at most one server.
a. A cache
b. A recursive
c. An iterative
d. All the above
The correct **answer** is b

538. In address-to-name resolution the _____ domain is used.
a. Reverse
b. Generic
c. Country
d. Inverse
The correct **answer** is d

539. How is the lifetime of a name-to-address resolution in cache memory controlled?
a. By the time-to-live field set by the server
b. By the time-to-live counter set by the server
c. By the time-to-live field set by the authoritative server
d. (b) and (c)
The correct **answer** is d

540. A DNS response is classified as _____ if the information comes from a cache memory.
a. Authoritative

b. Recursive
c. Unauthoritative
d. Iterative
The correct **answer** is c

541. A host with the domain name pit.arc.nasa.gov. is on the _____ level of the DNS hierarchical tree. (The root is level 1.)
a. Fourth
b. Fifth
c. Third
d. Not enough information given
The correct **answer** is b

542. A DNS _____ server's zone is the entire DNS tree.
a. Secondary
b. Root
c. Primary
d. All the above
The correct **answer** is b

543. To find the IP address of a host when the domain name is known, the _____ can be used.
a. Inverse domain
b. Generic domains
c. Country domains
d. (b) or (c)
The correct **answer** is a

544. A DNS _____ server gets its data from another DNS server.
a. Root
b. Primary
c. Secondary
d. All the above
The correct **answer** is c

545. A DNS _____ server creates, maintains, and updates the zone file.
a. Root
b. Primary
c. Secondary
d. All the above
The correct **answer** is b

546. A host with the domain name trinity.blue.vers.inc is on the _____ level of the DNS hierarchical tree. (The root is level 1.)
a. Fourth
b. Fifth
c. Third
d. Not enough information given
The correct **answer** is d

547. In the domain name chal.atc.fhda.edu, _____ is the least specific label.
a. fhda
b. edu
c. chal
d. atc
The correct **answer** is b

548. In the domain name chal.atc.fhda.edu, _____ is the most specific label.
a. Fhda
b. chal
c. atc
d. edu
The correct **answer** is b

549. In _____ resolution the client could directly contact more than one server.

a. An iterative
b. A cache
c. A recursive
d. All the above
The correct **answer** is a

550. Which of the following domain names would most likely use a country domain to resolve its IP address?
a. chal.atac.fhda.edu
b. kenz.acct.sony.jp
c. gsfc.nasa.gov
d. mac.eng.sony.com
The correct **answer** is b

551. A resolver is the _____.
a. Host machine
b. DNS client
c. DNS server
d. Root server
The correct **answer** is b

552. Which of the following is true?
a. FTP allows systems with different directory structures to transfer files.
b. FTP allows a system using ASCII and a system using EBCDIC to transfer files.
c. FTP allows a PC and a SUN workstation to transfer files.
d. All the above are true.
The correct **answer** is d

553. An email contains a textual birthday greeting, a picture of a cake, and a song. The text must precede the image. What is the content-type?
a. Multipart/parallel
b. Multipart/digest
c. Multipart/alternative
d. Multipart/mixed
The correct **answer** is d

554. During an FTP session the control connection is opened _____.
a. As many times as necessary
b. Exactly once
c. Exactly twice
d. All the above
The correct **answer** is b

555. The purpose of the MTA is _____.
a. Transferral of messages across the Internet
b. Message preparation
c. Envelope creation
d. (a) and (b)
The correct **answer** is a

556. In anonymous FTP, the user can usually _____.
a. Store files
b. Retrieve files
c. Navigate through directories
d. Do all the above
The correct **answer** is b

557. Which part of the mail created by the UA contains the sender and receiver names?
a. Header
b. Body
c. Envelope
d. Address
The correct **answer** is a

558. In the email address mackenzie@pit.arc.nasa.gov, what is the domain name?
a. mackenzie
b. mackenzie@pit.arc.nasa.gov
c. pit.arc.nasa.gov
d. (a) and (b)
The correct **answer** is c

559. The _____ field in the MIME header uses text to describe the data in the body of the message.
a. Content-transfer-encoding
b. Content-Id
c. Content-type
d. Content-description
The correct **answer** is b

560. The _____ field in the MIME header describes the method used to encode the data.
a. Content-Id
b. Content-description
c. Content-type
d. Content-transfer-encoding
The correct **answer** is d

561. The _____ field in the MIME header has type and subtype subfields.
a. Content-transfer-encoding
b. Content-type
c. Content-Id
d. Content-description
The correct **answer** is b

562. A JPEG image is sent as email. What is the content-type?
a. Multipart/mixed
b. Multipart/image
c. Image/basic
d. Image/JPEG
The correct **answer** is d

563. The purpose of the UA is _____.
a. Message preparation
b. Envelope creation
c. Transferral of messages across the Internet
d. (a) and (b)
The correct **answer** is d

564. The _____ field in the MIME header is the type of data and the body of the message.
a. Content-Id
b. Content-description
c. Content-type
d. Content-transfer-encoding
The correct **answer** is c

565. A message is fragmented into three email messages. What is the content-type?
a. Message/partial
b. Multipart/partial
c. Multipart/mixed
d. Message/RFC822
The correct **answer** is a

566. A client machine usually needs _____ to send email.
a. Only POP
b. Both SMTP and POP
c. Only SMTP
d. None of the above
The correct **answer** is c

567. In FTP, what attributes must be defined by the client prior to transmission?
a. Data type
b. File structure
c. Transmission mode
d. All the above
The correct **answer** is d

568. In FTP, there are three types of _____: stream, block, and compressed.
a. Data structures
b. Transmission modes
c. Files
d. All the above
The correct **answer** is b

569. In FTP, ASCII, EBCDIC, and image define an attribute called _____.
a. Data structure
b. Transmission mode
c. File type
d. All the above
The correct **answer** is c

570. In FTP, when you _____, it is copied from the server to the client.
a. Retrieve a file
b. Store a file
c. Retrieve a list
d. (a) and (c)
The correct **answer** is d

571. In FTP, when you _____, it is copied from the client to the server.
a. Retrieve a file
b. Store a file
c. Retrieve a list
d. (a) and (c)
The correct **answer** is b

572. An email contains a textual birthday greeting, a picture of a cake, and a song. The order is not important. What is the content-type?
a. Multipart/digest
b. Multipart/alternative
c. Multipart/mixed
d. Multipart/parallel
The correct **answer** is d

573. During an FTP session the data connection is opened _____.
a. Exactly once
b. Exactly twice
c. As many times as necessary
d. All the above
The correct **answer** is c

574. Which of the following is a retrieval method?
a. HTTP
b. FTP
c. TELNET
d. All the above
The correct **answer** is d

575. A request message always contains _____.
a. A status line, a header, and a body
b. A status line and a header
c. A header and a body

d. A request line and a header
The correct **answer** is d

576. Which of the following is present in both a request line and a status line?
a. URL
b. Status code
c. HTTP version number
d. Status phrase
The correct **answer** is c

577. Which of the following is not a client program in WWW?
a. FTP
b. HTTP
c. HTML
d. TELNET
The correct **answer** is c

578. A user wants to replace a document with a newer version; the request line contains the _____ method.
a. PUT
b. GET
c. POST
d. COPY
The correct **answer** is a

579. The _____ header can specify the client configuration and the client's preferred document format.
a. Request
b. Response
c. General
d. Entity
The correct **answer** is a

580. The _____ tags enclose binary code or byte code.
a. Executable contents
b. Image
c. List
d. Hyperlink
The correct **answer** is a

581. Which type of Web document is run at the client site?
a. Dynamic
b. Active
c. Static
d. All the above
The correct **answer** is b

582. HTTP has similarities to both _____ and _____.
a. FTP; MTV
b. FTP; URL
c. FTP; SNMP
d. FTP; SMTP
The correct **answer** is d

583. A user needs to send the server some information. The request line method is _____.
a. OPTION
b. POST
c. PATCH
d. MOVE
The correct **answer** is b

584. A response message always contains _____.
a. A header and a body
b. A status line, a header, and a body

c. A request line and a header
d. A status line and a header
The correct **answer** is c

585. The _____ header supplies information about the body of a document.
a. General
b. Request
c. Entity
d. Response
The correct **answer** is c

586. The _____ header can specify the server configuration or provide information about a request.
a. General
b. Request
c. Response
d. Entity
The correct **answer** is c

587. Hypertext documents are linked through _____.
a. TELNET
b. Pointers
c. DNS
d. Homepages
The correct **answer** is b

588. Which of the following is an interpreter?
a. CGI
b. FTP
c. HTTP
d. HTML
The correct **answer** is d

589. What are the components of a browser?
a. Controller, client program, interpreter
b. Retrieval method, host computer, path name
c. Hypertext, hypermedia, HTML
d. All the above
The correct **answer** is a

590. A user needs to retrieve a document from the server; the request line contains the _____ method.
a. GET
b. HEAD
c. POST
d. PUT
The correct **answer** is a

591. Which type of Web document is fixed-content and is created and stored at the server site?
a. Dynamic
b. Active
c. Static
d. All the above
The correct **answer** is c

592. The _____ of a Web page contains the title and parameters used by the browser.
a. Attributes
b. Tags
c. Head
d. Body
The correct **answer** is c

593. Which type of Web document is created at the server site only when requested by a client?
a. Active

b. Static
c. Dynamic
d. All the above
The correct **answer** is c

594. In < IMG SRC="Pictures/book1.gif" ALIGN=middle> ALIGN is _____.
a. The head
b. The body
c. A tag
d. An attribute
The correct **answer** is d

595. A user wants to copy a file to another location; the request line contains the _____ method.
a. PUT
b. PATCH
c. COPY
d. POST
The correct **answer** is c

596. What does the URL need to access a document?
a. Path name
b. Host computer
c. Retrieval method
d. All the above
The correct **answer** is d

597. Which type of Web document is transported from the server to the client in binary form?
a. Active
b. Static
c. Dynamic
d. All the above
The correct **answer** is a

598. An ending tag is usually of the form _____
a. <tagname>
b. <tagname!>
c. </tagname>
The correct **answer** is c

599. An applet is a small application program written in _____
a. Shell script
b. Java
c. C
d. C++
The correct **answer** is b

600. Stock quotations are posted on the Web. This is probably a(n) _____ document.
a. Passive
b. Dynamic
c. Active
d. Static
The correct **answer** is b

601. Updates for a satellite's coordinates can be obtained on the WWW. This is probably a(n) _____ document.
a. Passive
b. Dynamic
c. Active
d. Static
The correct **answer** is b

602. A user needs to move a file to another location. The request line method is _____.
a. PATCH

b. MOVE
c. PUT
d. GET
The correct **answer** is b

603. Which category of HTML tags allows the listing of documents?
a. Image
b. Hyperlink
c. List
d. Executable contents
The correct **answer** is c

604. A program can use _____ to write a CGI program.
a. Bourne shell script
b. Perl
c. C
d. Any of the above
The correct **answer** is d

605. An unemployed actor has posted his resume on the Web. This is probably a(n) _____ document.
a. Passive
b. Dynamic
c. Active
d. Static
The correct **answer** is d

606. The server receives input from a browser through _____.
a. An attribute
b. A form
c. A tag
d. Any of the above
The correct **answer** is b

607. Output from a CGI program is _____.
a. Text
b. Graphics
c. Binary data
d. Any of the above
The correct **answer** is d

608. _____ is used to enable the use of active documents.
a. CGI
b. Java
c. HTML
d. All the above
The correct **answer** is c

609. Java is _____.
a. A programming language
b. A run-time environment
c. A class library
d. All the above
The correct **answer** is d

610. An applet is _____ document application program.
a. An active
b. A passive
c. A static
d. A dynamic
The correct **answer** is a

611. In a real-time video conference, data from the server are _____ to the client sites.

a. Unicast
b. Broadcast
c. Multicast
d. None of the above
The correct **answer** is c

612. A _____ adds signals from different sources to create a single signal.
a. Mixer
b. Translator
c. Timestamp
d. Sequence number
The correct **answer** is a

613. The RTCP _____ message shuts down a stream.
a. Application-specific
b. Source description
c. Bye
d. Farewell
The correct **answer** is c

614. A standard that allows a telephone (connected to a public telephone network) to talk to a computer connected to the Internet is _____.
a. SIP
b. H.323
c. IEEE 802.3
d. V.90bis
The correct **answer** is b

615. A _____ changes the format of a high-bandwidth video signal to a lower-quality narrow-bandwidth signal.
a. Timestamp
b. Sequence number
c. Mixer
d. Translator
The correct **answer** is d

616. An RTP packet is encapsulated in a(n) _____.
a. IP datagram
b. RTCP packet
c. UDP user datagram
d. TCP segment
The correct **answer** is c

617. The last step in JPEG, _____, removes redundancies.
a. Blocking
b. Compression
c. Quantization
d. Vectorization
The correct **answer** is b

618. A _____ shows when a packet was produced relative to the first or previous packet.
a. Sequence number
b. Threshold
c. Timestamp
d. Playback buffer
The correct **answer** is c

619. _____ is a protocol to set up and terminate a connection between a computer on the Internet and a telephone (connected to a public telephone network).
a. H.245
b. H.225
c. H.323
d. Q.931

The correct **answer** is d

620. TCP is not suitable for real-time traffic because _____.
a. There is no provision for timestamping
b. There is no support for multicasting
c. Missing packets are retransmitted
d. All the above
The correct **answer** is d

621. JPEG encoding involves _____, a process that reveals the redundancies in a block.
a. Quantization
b. Vectorization
c. Blocking
d. The DCT
The correct **answer** is d

622. The RTCP _____ report informs the sender and other receivers about the quality of service.
a. Sender
b. QoS
c. Receiver
d. Passive
The correct **answer** is c

623. _____ is an application layer protocol that establishes, maintains, and terminates a multimedia session.
a. DCT
b. SIP
c. RTCP
d. JPEG
The correct **answer** is b

624. For streaming stored audio/video, the _____ holds information about the audio video file.
a. Jitter
b. Alpha file
c. Beta file
d. Metafile
The correct **answer** is d

625. _____ is a control protocol that adds functionalities to the streaming process.
a. TCP/IP
b. RTSP
c. HTTP
d. SIP
The correct **answer** is b

626. The audio/video stream is sent by the media server to the _____.
a. Media player
b. Browser
c. Web server
d. None of the above
The correct **answer** is a

627. Voice over IP is a(n) _____ audio/video application.
a. Interactive
b. Streaming stored
c. Streaming live
d. None of the above
The correct **answer** is a

628. _____ is a SIP message type.
a. INVITE
b. CANCEL
c. OPTIONS

d. All the above

The correct **answer** is d

629. A _____ is involved in an SIP mechanism to find the IP address of a callee.
a. Proxy server
b. Registrar server
c. Media server
d. (a) and (b)

The correct **answer** is d

630. _____ are used to number the packets of a real-time transmission.
a. Translators
b. Timestamps
c. Playback buffers
d. Sequence numbers

The correct **answer** is d

631. In the _____ the encryption of each 8-byte block is independent of the others.
a. CVF
b. CSM
c. ECB mode
d. CBC mode

The correct **answer** is c

632. In the public-key method of cryptography, which key is publicly known?
a. Encryption key only
b. Decryption key only
c. Both
d. None of the above

The correct **answer** is a

633. A cipher is _____.
a. An encryption algorithm
b. A decryption algorithm
c. A private key
d. (a) or (b)

The correct **answer** is d

634. Before a message is encrypted, it is called _____.
a. Ciphertext
b. Cryptotext
c. Cryptonite
d. Plaintext

The correct **answer** is d

635. If 20 people need to communicate using symmetric-key cryptography, _____ symmetric keys are needed.
a. 190
b. 200
c. 19
d. 20

The correct **answer** is a

636. The _____ is an example of polyalphabetic substitution.
a. P-box
b. Vigenere cipher
c. S-box
d. Product block

The correct **answer** is b

637. In the symmetric-key method of cryptography, which key is publicly known?
a. Encryption key only
b. Decryption key only

c. Both
d. None of the above
The correct **answer** is d

638. The RSA algorithm uses a _____ cryptography method.
a. Private-key
b. Symmetric-key
c. Denominational
d. Public-key
The correct **answer** is d

639. The _____ is a block cipher.
a. P-box
b. S-box
c. Product block
d. All the above
The correct **answer** is d

640. We use an cryptography method in which the plaintext AAAAAA becomes the ciphertext BCDEFG. This is probably _____.
a. Monoalphabetic substitution
b. Transposition
c. Polyalphabetic substitution
d. None of the above
The correct **answer** is c

641. One way to encrypt and decrypt long messages is through the use of the _____.
a. ECB mode
b. CBC mode
c. CFM
d. All the above
The correct **answer** is d

642. An initialization vector is needed in the _____.
a. CSM
b. CBC mode
c. CVF
d. (a) and (b)
The correct **answer** is d

643. In the public-key method of cryptography, only the receiver has possession of the _____.
a. Public key
b. Both keys
c. Private key
d. None of the above
The correct **answer** is c

644. After a message is decrypted, it is called _____.
a. Ciphertext
b. Cryptotext
c. Cryptonite
d. Plaintext
The correct **answer** is d

645. We use a cryptography method in which the character Z always substitutes for the character G. This is probably _____.
a. Polyalphabetic substitution
b. Transpositional
c. Monoalphabetic substitution
d. None of the above
The correct **answer** is c

646. A protocol called _____ describes the certificate issued by a CA in a structural way.
a. KDC

b. X.509
c. CA level 1
d. Kerberos
The correct **answer** is b

647. Windows 2000 uses an authentication protocol called _____.
a. Otway-Rees
b. Kerberos
c. Diffie-Hellman
d. Needham-Schroeder
The correct **answer** is b

648. In the digital signature technique, the sender of the message uses _____ to create ciphertext.
a. His or her own public key
b. His or her own private key
c. His or her own symmetric key
d. The receiver's private key
The correct **answer** is b

649. A _____ is a trusted third party that solves the problem of symmetric-key distribution.
a. TLS
b. Firewall
c. CA
d. KDC
The correct **answer** is d

650. In a _____ attack, a message captured by an intruder is illegally sent a second time.
a. Return
b. Replay
c. Man-in-the-middle
d. Bucket brigade
The correct **answer** is b

651. In the _____ protocol, a nonce is decremented by 1 so that an intruder cannot send the exact same message a second time.
a. Needham-Schroeder
b. Diffie-Hellman
c. Otway-Rees
d. Kerberos
The correct **answer** is a

652. If user A wants to send an encrypted message to user B, the plaintext is encrypted with the public key of _____.
a. The network
b. User A
c. User B
d. (a) or (b)
The correct **answer** is c

653. When symmetric-key encryption is combined with private-key encryption, the _____ key is encrypted with the public key.
a. Skeleton
b. Private
c. Public
d. Symmetric
The correct **answer** is d

654. The _____ issues tickets for the real server.
a. Real server
b. Data server
c. AS
d. TGS
The correct **answer** is c

655. In _____-key cryptography, everyone has access to all the public keys.
a. Private
b. Certified
c. Symmetric
d. Public
The correct **answer** is c

656. In the digital signature technique, the receiver of the message uses _____ to create plaintext.
a. The sender's public key
b. Her or his own symmetric key
c. Her or his own private key
d. Her or his own public key
The correct **answer** is a

657. A _____ is a large number used only once that helps distinguish a fresh authentication request from a repeated one.
a. Ticket
b. Realm
c. Nonce
d. Public key
The correct **answer** is c

658. A _____ certifies the binding between a public key and its owner.
a. KDC
b. TLS
c. CA
d. Firewall
The correct **answer** is c

659. In an authentication using symmetric keys, if 10 people need to communicate, we need _____ keys.
a. 90
b. 10
c. 20
d. 45
The correct **answer** is d

660. In the _____ protocol, the symmetric key is K = G^{xy} mod N, where G and N are public numbers.
a. Needham-Schroeder
b. Otway-Rees
c. Diffie-Hellman
d. Kerberos
The correct **answer** is c

661. In a _____ attack, an intruder comes between two communicating parties intercepting and replying to their messages.
a. Bucket-in-the-middle
b. Replay
c. Return
d. Man-in-the-middle
The correct **answer** is d

662. A _____ is a trusted third party that establishes a symmetric key between two parties who wish to communicate.
a. PKI
b. TGS
c. KDC

d. CA

The correct **answer** is c

663. _____ is an authentication protocol that needs an authentication server and a ticket-granting server.

a. Needham-Schroeder
b. Diffie-Hellman
c. Otway-Rees
d. Kerberos

The correct **answer** is d

664. The _____ is the KDC in the Kerberos protocol.

a. Real server
b. Data server
c. AS
d. TGS

The correct **answer** is c

665. The _____ field in the authentication header and the ESP header define the security method used in creating the authentication data.

a. Authentication data
b. SPI
c. Padding
d. Sequence number

The correct **answer** is b

666. Tunneling is a technique in which the IP datagram is first _____ and then _____.

a. Encapsulated in another datagram; encrypted
b. Encrypted; encapsulated in another datagram
c. Authenticated; encrypted
d. Encrypted; authenticated

The correct **answer** is b

667. _____ is an IP layer security protocol that only provides integrity and authentication.

a. PGP
b. ESP
c. IPSec
d. AH

The correct **answer** is d

668. An _____ is a private network with no external access that uses the TCP/IP suite.

a. Internet
b. Intranet
c. internet
d. Extranet

The correct **answer** is b

669. IPSec requires a logical connection between two hosts using a signaling protocol called _____.

a. PGP
b. TLS
c. AH
d. SA

The correct **answer** is d

670. An _____ is a private network with limited external access that uses the TCP/IP suite.

a. Intranet
b. Extranet

c. Internet
d. internet
The correct **answer** is b

671. The handshake protocol and data exchange protocol are part of _____.
a. TLS
b. CA
c. KDC
d. SSH
The correct **answer** is a

672. _____ is a collection of protocols that provide security at the IP layer level.
a. TLS
b. SSH
c. IPSec
d. PGP
The correct **answer** is c

673. A method to provide for the secure transport of email is called _____.
a. TLS
b. PGP
c. SA
d. IPSec
The correct **answer** is b

674. A VPN uses _____ to guarantee privacy.
a. IPSec
b. Tunneling
c. Both (a) and (b)
d. None of the above
The correct **answer** is c

675. A _____ can forward or block messages based on the information in the message itself.
a. Message digest
b. Proxy firewall
c. Packet-filter firewall
d. Private key
The correct **answer** is b

676. _____ is an IP layer security protocol that provides privacy as well as integrity and authentication.
a. AH
b. PGP
c. IPSec
d. ESP
The correct **answer** is d

677. _____ is a transport layer security protocol.
a. PGP
b. IPSec
c. TLS
d. AH
The correct **answer** is c

678. An IP datagram carries an authentication header if the _____ field of the IP header has a value of 51.
a. Protocol
b. Security parameter index

c. Sequence number
d. Next-header
The correct **answer** is a

679. A _____ network is totally isolated from the global Internet.
a. Private
b. Hybrid
c. Virtual private
d. Any of the above
The correct **answer** is a

680. A _____ network can use a leased line for intraorganization communication and the Internet for interorganization communication.
a. Private
b. Hybrid
c. Virtual private
d. Any of the above
The correct **answer** is b

681. In a VPN, _____ encrypted.
a. The inner datagram is
b. Neither the inner nor the outer datagram is
c. The outer datagram is
d. Both inner and outer datagrams are
The correct **answer** is d

682. A _____ can forward or block packets based on the information in the network layer and transport layer headers.
a. Proxy firewall
b. Message digest
c. Packet-filter firewall
d. Private key
The correct **answer** is c