COMPUTER NETWORKS TEST 4

Number of Questions: 25 **Section Marks: 30**

Directions for questions 1 to 25: Select the correct alternative from the given choices.

1. Which of the following IP address belongs to class A network?
(A) 130. 140. 180. 210 (B) 127. 190. 120. 191
(C) 125. 150. 160. 189 (D) 132. 131. 139. 134

2. What will be the destination address if host A with IP address 156.180.190.16 wants to send data to all the members in network with network ID 19?
(A) 255.255.255.255 (B) 19.255.255.255
(C) 156.19.255.255 (D) 156.180.255.255

3. Which of the following work stations does not implement network layer?
(A) Switch (B) Brouter
(C) Gate way (D) Router

4. _____ layer responds when packet gets discarded due to its TTL (when TTL becomes 0)
(A) Application layer (B) Transport layer
(C) Network layer (D) Physical layer

5. Which of the following algorithm is not related to private key cryptography?
(A) DES (B) RSA
(C) AES (D) IDEA

6. What is the minimum positive integer 'p' such that $3^p \bmod 17 = 1$?
(A) 5 (B) 8
(C) 12 (D) 16

7. X. 21 is:
(A) a method of determining which device has access to the transmission medium at any time
(B) a method for access control techniques for multiple access transmission media
(C) a very common bit oriented data link protocol
(D) a network access standard for connecting stations to a circuit switched networks

8. The network topology that supports bi-directional links between each possible node is:
(A) ring (B) star
(C) tree (D) mesh

9. Match the following:

Column–I		Column–II	
(a)	Logical addressing system	(i)	16 bit
(b)	Physical addressing system	(ii)	32 bit
(c)	Port addressing system	(iii)	48 bit

(A) a–(i) b–(ii) c–(iii) (B) a–(ii), b–(i), c–(iii)
(C) a–(ii), b–(iii), c–(i) (D) a–(iii), b–(i), c–(ii)

10. In TCP the flags syn = 0 and ack = 1 indicates:
(A) open connection packet
(B) open connection ack
(C) data packet
(D) reply packet

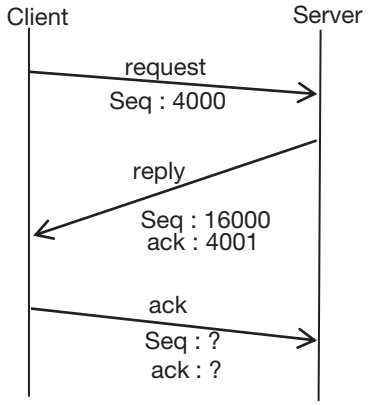
11. A user '*A*' got an email containing multi media (requires high band width) if the band width is limited then:
(A) user can open the mail using SMTP
(B) user can download the message using the POP3
(C) user can partially download email using IMAP4
(D) user cannot open (or) download the email

12. MIME supports
(A) Text in character sets other than ASCII
(B) Non text attachments
(C) Message bodies with multiple parts
(D) All the above

13. For a link having bandwidth 10 Mbps, calculate the time to wrap the sequence numbers of TCP? (approximate value)
(A) 3436 minutes (B) 100 seconds
(C) 57 minutes (D) 10 minutes

14. Sender's window size in TCP is determined by
(i) Receiver window size
(ii) Congestion window size
(A) Both (i) and (ii)
(B) Only (i)
(C) Only (ii)
(D) None of the above

15. Consider the connection establishment in TCP using 3 way handshaking



What will be the values of sequence number (seq) and ack for the last hand shake?
(A) seq = arbitrary number ack = 16001
(B) seq = 4000 ack = arbitrary number
(C) seq = 4000 ack = 16001
(D) seq = 4001 ack = 16002

16. Which of the following can be used for only source IP in a packet header?
(A) 10.1.1.1 (B) 0.0.0.0
(C) 0.1.1.1 (D) 127.1.1.1

17. If WAN link is 2 Mbps and round trip time between source and destination is 300 m sec, what would be the optional TCP window size needed to fully utilize the line?
(A) 60,000 bits (B) 75,000 bytes
(C) 75,000 bits (D) 60,000 bytes

18. Device *A* IP address is 172.16.17.30/20 Device *B* IP address is 172.16.28.15/20, which one of the following statement is correct?
(A) Both devices are in the same subnet
(B) Devices are in different subnets
(C) Variable length subnet mask is used in the network
(D) Insufficient data

19. If the IP address is 130.45.34.56 and subnet mask is 255.255.240.0, then what is the subnet address?
(A) 130.45.0.0 (B) 130.45.34.0
(C) 130.45.32.0 (D) 130.45.32.56

20. If the IP address is 196.196.64.170 and subset mask is 255.255.255.240, what is the broadcasting address to the subnet?
(A) 196.196.64.255 (B) 255.255.255.255
(C) 196.196.240.170 (D) 196.196.64.175

21. Consider the following Networks 206.82.2.0, 206.82.3.0, 206.82.4.0 and 206.82.5.0; the Super net mask will be:
(A) 255.255.252.0 (B) 255.255.244.0
(C) 255.255.255.82 (D) 206.82.1.0/22

22. Consider the sub net mask of IP address 255.0.0.0 to which class of IP address this super net mask belongs to?
(A) class A (B) class B
(C) class C (D) None of these

Linked Answer Questions 23 and 24:
RSA algorithm is used by choosing two prime number $p = 3$, $q = 11$.

23. What are the encryption and decryption keys?
(A) 3, 7 (B) 2, 6
(C) 5, 7 (D) 8, 12

24. What will be the encrypted message for GATE (if $A = 1$, $B = 2$)?
(A) 1311426 (B) 2416513
(C) 10134261 (D) 1421331

25. Which of the following is TRUE for authentication and key management among two parties?
(A) 3 hand shake is necessary for the authentication with each handshake done with private key cryptography
(B) 3 handshake is necessary for the authentication and key management with each hand shake, done with public key cryptography
(C) 3 hand shake is necessary for the authentication and key management with 2 hand shakes one with public key cryptography and one with private key cryptography
(D) 3 hand shake is necessary for the authentication and key management with handshake as public key cryptography and 2 handshakes as private key cryptography

Answer Keys

1. C	**2.** B	**3.** A	**4.** C	**5.** B	**6.** D	**7.** D	**8.** D	**9.** C	**10.** C
11. C	**12.** D	**13.** C	**14.** A	**15.** C	**16.** B	**17.** B	**18.** A	**19.** C	**20.** D
21. B	**22.** B	**23.** A	**24.** A	**25.** C					

Hints and Explanations

1. Class *A* IP address range is 1–126 is in the first octet. In the given options, option (C) has the 125 in the first octet. So, 125.150.160, belongs to class *A* network. Choice (C)

2. Direct Broadcasting address for the network ID 19 will be 19.255.255.255. Direct Broadcasting address in the same network is 255.255.255.255. Choice (B)

3. Switch has only two layers, i.e. Physical layer and data link layer. Choice (A)

4. When packet gets discarded with TTL = 0, then the network layer sends the message to source, so that it can choose another route. Choice (C)

5. RSA is public key cryptography. Choice (B)

6. $3^{16} \bmod 17 = 1$. Choice (D)

7. X.21 is a network access standard for connecting stations to a circuit switched networks. Choice (D)

8. In mesh topology, each node is connected to the other nodes with a link, so in Mesh topology it support bidirectional links. Mostly, Mesh topology is used in Internet. Choice (D)

9. Logical addressing system (IP address) takes a 32-bits.
Physical addressing system takes 48-bits.
Part addressing system takes 16-bits.
Choice (C)

10. When SYN = 0 and ACK = 1, it indicates the data packet in TCP. Choice (C)

11. User can download partially using IMAP4 protocol, when the network bandwidth is low. Choice (C)

12. MIME is used for the message having Multimedia objects. Choice (D)

13. TCP uses 32-bit sequence number, we have 2^{32} distinct numbers
Warp around time
$$= \frac{2^{32} \times 8}{10 \times 10^6}$$
= 57 minutes (approximately)
Choice (C)

14. Sender's window size is determined by using Receiver window size and congestion window size. Choice (A)

15. As the cluent received reply with sequence number 16000, it sends the ACK with sequence number 16001 and as it is not sending any data packet it sends with same sequence number.
i.e. sent in request i.e. 4000. Choice (C)

16. 0.0.0.0 Address can be used as only source address in DHCP. Choice (B)

17. In one sec we can send 2×10^6 bits
In 300×10^{-3} sec we can send
$= 300 \times 10^{-3} \times 2 \times 10^6$ bits
$= 600 \times 10^3$ bits
= 6,00,000 bits (or) 75000 bytes.
Choice (B)

18. Subnet mask for devices will be 255.255.240.0 as it has borrowed 4 bits from host ID, if AND operation is performed between subnet mask and IP address, then the result for both will be 172.16.16.0. Choice (A)

19. If we perform AND operation between IP and mask we will get subnetwork address
IP = 10000010.00101101.0010000.00111000
Subnet mask
11111111.11111111.1111<u>0</u>000.00000000
130 . 45 . 32 .0. Choice (C)

20. Subnet mask = 255.255.255.240
11111111.11111111.11111111.11110000
IP = 196.196.64.10101010
From the above we can identify that if IP belongs to the subnet whose id is 160 with host as 10
The broadcast address will be196.196.64.175.
Choice (D)

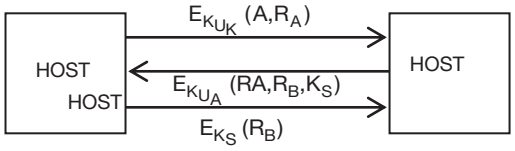
21. the IP addresses are:
206.82.00000<u>010</u>.0
206.82.0000000<u>.11</u>.0
206.82.00000<u>100</u>.0
206.82.00000<u>101</u>.0
The super net mask is 255.255.244.0 Choice (B)

22. 255.0.0.0 can be a subnet for class *A*, supernet for class *B* and class *C*. Choice (B)

23. (A) $p = 3$ $q = 11$
$n = p \times q = 33$
$z = (p - 1)(q - 1) = 20$
gcd $(d, z) = 1$
gcd $(d, 20) = 1$
$\therefore$ $d = 7$
$(e \times 7) \bmod 20 = 1$
$\therefore$ $e = 3$. Choice (A)

24. G A T E
7 1 20 5
Encrypted message
$= 7^3 \bmod 33 = 13$
$1^3 \bmod 33 = 1$
$20^3 \bmod 33 = 14$
$5^3 \bmod 33 = 26$
Message is = 1311426. Choice (A)

25. $E_{k_{uB}}(A, R_A)$



R_A = random number generated by *A*
R_B = random number generated by *B*
K_S = session key
The first two handshakes are public key cryptography and last one is private key cryptography. Choice (C)