MIDTERM EXAMINATION
IT 304 – NETWORKING 2

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Section:_____

Instructions:
Please read each question carefully before selecting/providing your answer. Choose the most accurate answer for each question.

1. The rules that govern network communications including the message format, message size, timing, and encapsulation, are known as network:
   A. signaling **B. protocols** C. messaging D. encoding

2. Which protocol is responsible for guaranteeing reliable delivery?
   A. TCP B. Ethernet C. HTTP D. IP

3. Which protocol is used by routers to forward messages?
   A. Ethernet B. HTTP C. TCP **D. IP**

4. (2 points) Which two layers of the OSI Model maps directly as the single network access layer in the TCP/IP model? (Choose two)
   A. data link B. application **C. physical** D. transport E. presentation F. network

5. IP addressing occurs at what layer of the OSI Model?
   A. application B. physical C. transport **D. network**

6. What networking term describes a particular set of rules at one layer that govern communication at that layer?
   A. duplex B. encapsulation C. error checking **D. protocol**

7. Which of the following is NOT a criterion for choosing a network media?
   A. The type of data that can be transmitted. B. The maximum distance that the media can successfully carry a signal.
   C. The environment in which the media is installed. D. The cost of installing the media.

8. What is the purpose of the OSI physical layer?
   A. controlling access to media.
   B. transmitting bits across the local media.
   C. performing error detection on received frames.
   D. exchanging frames between nodes over physical network media.

9. Which statement is correct about network protocols?
   A. Network protocols define the type of hardware that is used and how it is mounted in racks.
   B. They define how messages are exchanged between the source and the destination.
   C. They all function in the network access layer of TCP/IP.
   D. They are only required for exchange of messages between devices on remote networks.

10. What is the purpose of protocols in data communications?
    A. specifying the bandwidth of the channel or medium for each type of communication.
    B. specifying the device operating systems that will support the communication.
    C. providing the rules required for a specific type of communication to occur.
    D. dictating the content of the message sent during communication.

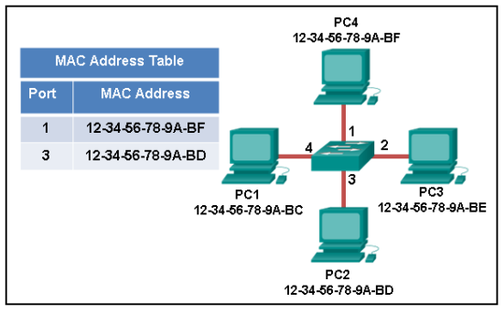
11. The process of prepending protocol information with information from another protocol is called:
    A. encoding B. framing C. packetizing **D. encapsulation**

12. When an Ethernet frame is sent out an interface, the destination MAC address indicates:
    A. The MAC address of the NIC card of a device, which is on this network or another network, that will receive the Ethernet frame.
    B. The MAC address of the NIC card that sent the Ethernet frame.
    C. The MAC address of the device, which is on this network, that will receive the Ethernet frame.
    D. The MAC address of the router.

13. What is one function of a Layer 2 switch?
    A. forwards data based on logical addressing.
    B. duplicates the electrical signal of each frame to every port.
    C. learns the port assigned to a host by examining the destination MAC address.
    D. determines which interface is used to forward a frame based on the destination MAC address.

14. Which type of address does a switch use to build the MAC address table?
A. destination MAC address **B. source MAC address** C. destination IP address D. source IP address

15. Refer to the exhibit below. The exhibit shows a small switched network and the contents of the MAC address table of the switch. PC1 has sent a frame addressed to PC3. What will the switch do with the frame?



A. The switch will discard the frame.
B. The switch will forward the frame only to port 2.
C. The switch will forward the frame to all ports except port 4.
D. The switch will forward the frame to all ports.

16. How many octets exist in an IPv4 address?
A. 4 B. 8 C. 16 D. 32

17. How large are IPv4 addresses? A. 8 bits B. 16 bits C. 32 bits D. 64 bits

18. What is the network number for an IPv4 address 172.16.34.10 with the subnet mask of 255.255.255.0?
A. 10 B. 34.10 C. 172.16.0.0 **D. 172.16.34.0**

19. Host-A has the IPv4 address and subnet mask 10.5.4.100 255.255.255.0. What is the network address of Host-A?
A. 10.5.4.100 **B. 10.5.4.0** C. 10.0.0.0 D. 10.5.0.0

20. Host-B has the IPv4 address and subnet mask 172.16.4.100 255.255.0.0. What is the network address of Host-B?
A. 172.16.4.100 B. 172.0.0.0 **C. 172.16.0.0** D. 172.16.4.0

21. (2 points) Host-A has the IPv4 address and subnet mask 10.5.4.100 255.255.255.0. Which of the following IPv4 addresses would be on the same network as Host-A? (Choose all that apply)
A. 10.0.0.98 B. 10.5.0.1 **C. 10.5.4.1** D. 10.5.100.4 **E. 10.5.4.99**

22. (2 points) Host-B has the IPv4 address and subnet mask 172.16.4.100 255.255.0.0. Which of the following IPv4 addresses would be on the same network as Host-B? (Choose all that apply)
A. 172.17.4.99 B. 172.17.4.1 C. 172.18.4.1 **D. 172.16.4.99** **E. 172.16.0.1**

23. (2 points) Host-C has the IPv4 address and subnet mask 192.168.1.50 255.255.255.0. Which of the following IPv4 addresses would be on the same network as Host-C? (Choose all that apply)
A. 192.168.2.1 B. 192.168.0.1 **C. 192.168.1.100** D. 192.168.0.100 **E. 192.168.1.1**

24. A host is transmitting a broadcast. Which host or hosts will receive it?
A. all hosts in the same network. B. a specially defined group of hosts.
C. the closest neighbor on the same network. D. all hosts on the internet.

25. Which statement describes one purpose of the subnet mask setting for a host?
A. It is used to describe the type of the subnet.
B. It is used to identify the default gateway.
C. It is used to determine to which network the host is connected.
D. It is used to determine the maximum number of bits within one packet that can be placed on a particular network.

26. Determine how many network bits and host bits are there in a Class C IPv4 address.
A. Network bits: 8, Host bits: 24 **B. Network bits: 24, Host bits: 8**
C. Network bits: 16, Host bits: 16 D. Network bits: 32, Host bits: 0

27. Determine how many network bits and host bits are there in a Class A IPv4 address.
A. Network bits: 8, Host bits: 24 B. Network bits: 16, Host bits: 16
C. Network bits: 24, Host bits: 8 D. Network bits: 32, Host bits: 0

28. (20 points) Given an IP address and Subnet Mask of **172.16.0.0 255.255.0.0**, answer the following question if the number of subnets created is 8. (Show your solution)
    (a) Determine how many bits you should borrow:
    (b) Determine the subnet mask:
    (c) Determine the usable hosts per subnet:
    (d) Determine the network address and the broadcast address for each subnet.

	Network Address	**Broadcast Address**
1st subnet		
2nd subnet		
3rd subnet		
4th subnet		
5th subnet		
6th subnet		
7th subnet		
8th subnet		

IP Address Choices

A. **10.0.0.5** B. **192.168.10.20** C. **172.16.5.8** D. **192.169.1.50** E. **172.32.15.45**
F. **10.255.255.255** G. **172.31.255.255** H. **192.167.10.15** I. **11.0.0.5** J. **172.15.0.1**
K. **8.8.8.8** L. **172.217.15.110** M. **198.51.100.45** N. **203.0.113.65** O. **131.107.255.255**
P. **10.1.1.1** Q. **172.16.0.10** R. **192.168.50.5** S. **172.31.10.200** T. **192.168.1.10**

29. (10 points) Refer to the IP addresses above to identify the *private* IPv4 addresses:

30. (10 points) Refer to the IP addresses above to identify the *public* IPv4 addresses: