UNIVERSITY OF GHANA

B.SC COMPUTER SCIENCE/INFORMATION TECHNOLOGY, SECOND SEMESTER EXAMINATIONS: 2015/2016

CSIT 202 – INTRODUCTION TO COMPUTERS & NETWORKS

INSTRUCTION:

Answer all the questions in Section A.

Answer Question B1 and any other two questions

TIME ALLOWED:

*TWO AND A HALF (2½) HOURS*

SECTION A (40 marks)

Answer all the questions in this Section.

Instructions: Please Circle the correct answer(s) as deemed appropriate.

1. What is the function of layer 4 of the OSI model?
   A. To represent data to the user including encoding and dialog
   B. To specify the packet type to be used by the communications
   C. To describe the order and reliable delivery of data between source and destination
   D. To apply framing information to the packet, based on the attached media

2. You are troubleshooting a communication problem. You seem to be able to communicate with Glen's website by IP address, but not by the fully qualified domain name (www.gleneclarke.com). What is most likely the problem?
   A. DHCP
   B. NAT
   C. DNS
   D. HTTP

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3. At what layer of the OSI model would a logical address be encapsulated?
    A. Transport Layer
    B. Physical Layer
    C. Network Layer
    D. Data link Layer

4. What is an advantage of network devices using open standard protocols?
    A. Competition and innovation are limited to specific types of products
    B. A client host and a server running different operating systems can successfully exchange data
    C. Network communication is confined to data transfers between devices from the same vector
    D. Internet access can be controlled by a single ISP in each market.

5. Which device connects a computer with a telephone line by providing modulation and demodulation of incoming and outgoing data?
    A. NIC
    B. CSU/DSU
    C. Router
    D. Modem

6. Refer to the exhibit below. Identify the devices labeled A, B, C, and D in the network physical documentation.
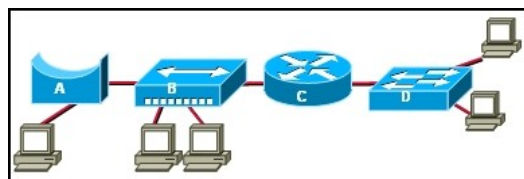

    A. A=bridge, B=switch, C=router, D=hub
    B. A=bridge, B=hub, C=router, D=switch
    C. A=bridge, B=router, C=hub, D=switch
    D. A=hub, B=bridge, C=router, D=switch

7. What are the two characteristics of 802.11 wireless networks? (choose two)
    A. Collisions can exist in the networks
    B. They are collision-free networks
    C. They use CSMA/CD technology
    D. Stations can transmit at any time
    E. They use CSMA/CA technology

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8. What is one advantage of defining network communication by the seven layers of the OSI model?
   A. It increases the bandwidth of a network
   B. It makes networking easier to learn and understand
   C. It eliminates many protocol restrictions
   D. It increases the throughput of a network
   E. It reduces the need for testing network connectivity

9. What is the purpose of the preamble in an Ethernet frame?
   A. Is used to identify the destination address
   B. Is used to identify the source address
   C. Is used as a padding for data
   D. Is used for timing synchronization

10. What makes it easier for different networking vendors to design software and hardware that will interoperate?
    A. OSI model
    B. Proprietary designs
    C. IP addressing scheme
    D. Standard logical topologies
    E. Standard physical topologies

11. Which term describes the process of adding headers to data as it moves down OSI layers?
    A. Division
    B. Encoding
    C. Separation
    D. Segmentation
    E. Encapsulation

12. Which two statement describe features or functions of the logical link control sub-layer in Ethernet standards? (Choose two)
    A. Logical link control is implemented in software
    B. The LLC sub-layer interacts directly with the NIC driver software.
    C. The data link layer uses LLC to communicate with the upper layers of the protocol suite.
    D. The LLC sub-layer is responsible for the placement and retrieval of frames on and off the media.

13. Which of the following is not a layer of the TCP/IP model?
    A. Application
    B. Physical

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C. Internet

D. Network Access

14. Which best describes the function of the physical layer?

    A. Defines the electrical and functional specifications for the link between end systems

    B. Provides reliable transit of data across a physical link

    C. Provides connectivity and path selection between two end systems

    D. Concerned with physical addressing, network topology and media access

15. Which wireless standard operates in the 5 GHZ transmission range and is capable of 54 Mbps of data throughput?

    A. 802.11

    B. 802.11a

    C. 802.11b

    D. 802.11g

16. When is a straight-through cable used in a network?

    A. When configuring a router

    B. When connecting a host to a host

    C. When connecting a switch to a router

    D. When connecting one switch to another switch

17. What type of cable is used to make an Ethernet connection between a host and a LAN switch?

    A. Console

    B. Rollover

    C. Crossover

    D. Straight-through

18. To ensure reliable LAN communications, what should a technician be looking for when attaching connectors to the ends of UTP cable?

    A. that the white-orange/orange pair is attached first

    B. that the wire pairs remain twisted as much as possible

    C. that one end of the shield is properly ground but not the other

    D. that 50 ohm termination resistors are on both ends

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19. Refer to the exhibit below. What is the appropriate cable to use at each of the numbered network connections?
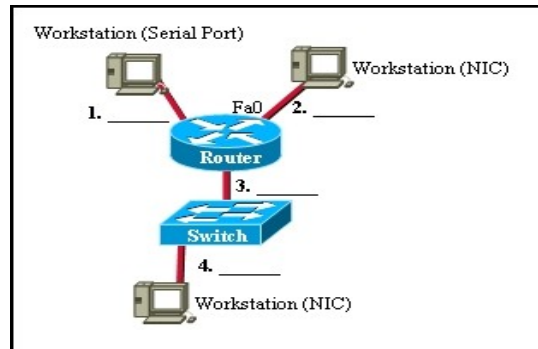
   A. 1-crossover; 2-straight-through; 3-crossover; 4-straight-through
   B. 1-straight-through; 2-crossover; 3-straight-through; 4-straight-through
   C. 1-straight-through; 2-crossover; 3-crossover; 4-straight-through
   D. 1-rollover; 2-crossover; 3-straight-through; 4-straight-through
   E. 1-rollover; 2-straight-through; 3-straight-through; 4-straight-through

20. A router has an Ethernet, Token Ring, serial, and ISDN interface. Which interfaces will have a MAC address?
   A. Serial and ISDN interfaces
   B. Ethernet and Token Ring interfaces
   C. Ethernet and ISDN interfaces
   D. Token Ring and serial interfaces

21. Which characteristics describe carrier sense multiple access collision detect (CSMA/CD)? (Choose three.)
   A. Reliable
   B. Point-to-point
   C. Nondeterministic
   D. Connection-oriented
   E. Collision environment
   F. First-come, first-served approach

22. Which of the following are specified by IEEE standards as sublayers of the OSI data link layer? (Choose two)
   A. Logical Link Control
   B. Logical Layer Control
   C. Media Access Control
   D. Logical Link Communication
   E. Media Access Communication

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F. Physical Access Communication

23. Bob is unable to surf the Internet and calls you over to his desk to troubleshoot. You use **ipconfig** on the system and notice the following IP configuration. What should you do?
    Local Area Network Connection:
    IPv4 Address…………: 192.19.210.79
    Subnet Mask…………: 255.255.255.0
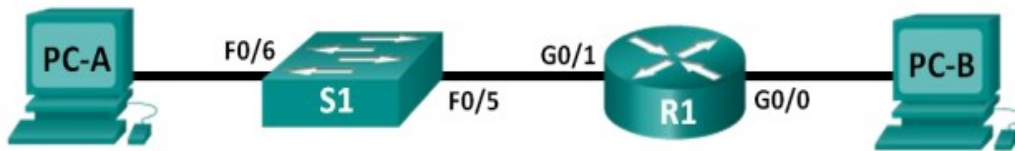   Default Gateway……...: 192.19.0.1

    A. Change his IP address to 169.254.210.79
    B. Change his IP address to 192.19.0.79
    C. Change his subnet mask to 255.0.0.0
    D. Remove his default gateway setting.

24. Which of the following are data link layer encapsulation details? (Choose two.)
    A. A header and trailer are added
    B. Data is converted into packets
    C. Packets are packaged into frames
    D. Frames are divided into segments
    E. Packets are changed into bits for Internet travel.

25. Sue is having trouble understanding some network concepts and asks you to help identify address types. Which of the following is considered a layer-2 address?
    A. 192.168.2.200
    B. www.gleneclarke.com
    C. COMPUTER1
    D. 00-AB-0F-2B-3C-4E

26. Which of the following describe full duplex transmission?
    A. Data frames are transmitted in one direction only over a single pair of wire
    B. Data frames are transmitted in both direction simultaneously over a single pair of wire
    C. Data frames are transmitted in both direction simultaneously over a two pairs of wires
    D. Data frames are transmitted in both direction simultaneously over a two wires

27. Which of the following are ways that bandwidth is commonly measured? (Choose three)
    A. GHzps
    B. Kbps
    C. Mbps
    D. MHzps
    E. Mbps
    F. Gbps

28. What are two reasons for physical layer protocols to use frame encoding techniques (choose two)
    A. To distinguish where the frame starts and ends
    B. To reduce the number of collisions on the media
    C. To distinguish data bits from control bits
    D. To increase the media throughput
    E. To provide better media error correction

29. Which basic process is used to select the best path for forwarding data?
    A. Encapsulation
    B. Addressing
    C. Routing
    D. Switching

30. After troubleshooting a router, the network administrator wants to save the router configuration so that it will be used automatically the next time that the router reboots. What command should be issued?
    A. Copy startup-config flash
    B. Copy running-config flash
    C. Reload
    D. Copy startup-config running-config
    E. Copy running-config startup-config

31. Why do hosts on an Ethernet segment that experience a collision use a random delay before attempting to transmit a frame?
    (A) A random delay is used to ensure a collision-free link
    (B) A random delay value for each device is assigned by the manufacturer.
    (C) A random delay helps prevent the stations from experiencing another collision during the transmission
    (D) A standard delay value could not be agreed upon among networking device vendors

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B1. Use the information provided in the topology and the addressing table in Figure 1.1 to answer the following questions **(a to k)**

Topology

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.0.1	255.255.255.0	N/A
	G0/1	192.168.1.1	255.255.255.0	N/A
S1	VLAN 1	N/A	N/A	N/A
PC-A	NIC	192.168.1.3	255.255.255.0	192.168.1.1
PC-B	NIC	192.168.0.3	255.255.255.0	192.168.0.1

Figure 1.1

    a. Console into the router and enable privileged EXEC mode.
    b. Enter configuration mode.
    c. Assign a device name to the router.
    d. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.
    e. Assign **CSIT202** as the privileged EXEC encrypted password.
    f. Assign **CSIT202** as the console password and enable login.
    g. Assign **CSIT202** as the VTY password for 9 users and enable login.
    h. Encrypt the clear text passwords.
    i. Create a banner that warns anyone accessing the device that **unauthorized access is prohibited.**
    j. Configure and activate both interfaces on the router.
    k. Save the running configuration to the startup configuration file.

B2.
    a) Briefly explain Virtual Private Networks? **[3 Marks]**
    b) Explain the three types of Virtual private Networks? **[6 Marks]**
    c) Write short notes on the following layers in OSI Reference Model. **[6 Marks]**
        i. Application

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ii. Network

iii. Transport

d) Explain the role of a Back-off algorithm? **[2Marks]**

e) The power delivered to an original laser is seven microwatts (7×10^{-6} Watts), and the total loss of a fiber link is 13dB. How much source power is needed? **[3 Marks]**

B3.

    a) Differentiate between a Data Terminal Equipment (DTE) and a Data communication Equipment. **[2 Marks]**

    b) A PING in networking stands for Packet Inter-Network Groper. How does the PING command works and what are the three basic test that can be performed? **[6 marks]**

    c) Explain the following with regards to layer 2 switching? **[6Marks]**

        i. Flooding a Frame

        ii. Forwarding a Frame

        iii. Filtering a Frame

    d) Explain Data Encapsulation? **[2Marks]**

    e) Differentiate between a passive Hub and an active Hub? **[4 Marks]**

B4.

    a. What is CSMA/CD in networking? **[2Marks]**

    b. Explain the following? **[6 Marks]**

        i. Router

        ii. Switch

        iii. Repeater

    c. How does data encapsulation work in relation to OSI network reference model? **[6Marks]**

    d. A network administrator is of the view that it would take lesser time to send the contents of a Compact Disk of data (700MB) over an ISBN line (128kbps) than to send the contents of a 15GB hard drive full of data over an OC-48 line (2.4Gbps). Is this true or false, explain? **[4 Marks]**

    e. What is the function of a Bridge? **[2 Mark]**

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