



UNIVERSITY OF GHANA

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BA/BSC COMPUTER SCIENCE/INFORMATION TECHNOLOGY SECOND

D SEMESTER EXAMINATIONS: 2016

CSIT 312: NETWORK SERVERS & INFRASTRUCTURE

ADMINISTRATION (3 CREDITS)

INSTRUCTIONS:

ANSWER ONLY TWO (2) QUESTIONS IN SECTION A AND ALL QUESTIONS IN SECTION B

ALL QUESTIONS MUST BE ANSWERED IN THE ANSWER BOOKLET

MARKS DISTRIBUTION:

section A: 60 MARKS. EACH QUESTION HAS A mark OF SIX (6).

SECTION B: FOURTY (40) MARKS. EACH HAS A MARK OF TWO (2).

TIME ALLOWED:

TWO AND HALF HOURS

SECTION A:

QUESTION 1

- a) Briefly explain cloud computing?
- b) What do you understand by the term network neutrality?
- c) List 5 disadvantages of cloud computing.
- d) State 2 disadvantages of MPLS.
- e) List 2 characteristics of MPLS.

- f) What are the acronyms for the 3 most common VPN protocols?
- g) What does PPTP stand for?
- h) What is the main benefit of VPNs compared to dedicated networks utilizing frame relay, leased lines, and traditional dial-up?

- i) What is the last valid host on the sub network 172.26.200.0/23?
- j) You are designing a subnet mask for the 172.22.0.0 network. You want 70 subnets with up to 300 hosts on each subnet. What subnet mask should you use?

QUESTION 2

- a) State 5 characteristics of cloud computing.
- b) State 2 cloud service models.
- c) State 2 disadvantages of IP routing.
- d) What does the acronym MPLS stand for?
- e) What does the acronym LDP stand for?
- f) What is FEC in MPLS?
- g) What does the term "tunneling" refers to in VPNs?
- h) List 2 techniques used to reduce address shortage in IPv4.
- i) Give an example of a NAT table.
- j) Give one major improvement in an IPv6 header.

QUESTION 3

- a) Describe 2 cloud service layers.
- b) List 5 advantages of virtual machines.
- c) What is a session message in LDP?
- d) Give one drawback of RSVP?
- e) Give one drawback of CR-LDP?
- f) Illustrate the position of LER and LSR.
- g) List 3 protocols used in VPN.

h) Give 2 advantages of VPN.

i) Give 2 disadvantages of VPN.

j) *How many subnets and hosts per subnet can you get from the network 172.30.0.0 255.255.248.0?*

QUESTION 4

a) Your ISP has provided you a T1 connection to their network. They have provided the interface at your end of the Serial connection an IP address of 16.32.96.109/30. For this particular situation, you must supply the IP address of the ISP's interface at the opposite end of the serial connection as your Gateway of Last Resort. What IP address would you specify as the Gateway of last resort?

i. How many hosts are allowed in each subnet?

ii. What is the Broadcast address for this network?

iii. What is the Network address for this network?

- a) State one opportunity in cloud computing.
- b) List 5 advantages of cloud computing.
- c) Describe the operation of MPLS.
- d) Illustrate MPLS operation.
- e) State 2 advantages of MPLS.
- f) What is a VPN?
- g) State 2 critical function of VPN?
- h) What is encryption?
- i) Give 2 features of IPv6.

SECTION B:

Q1. If a switch has three computers connected to it, with no VLANs present, how many broadcast and collision domains is the switch creating?

- a. Three broadcast and one collision
- b. Three broadcast and three collision
- c. One broadcast and three collision
- d. One broadcast and one collision

Q1. Acknowledgments, sequencing, and flow control are characteristics of which OSI layer?

- a. Layer 2

- b. Layer 3
- c. Layer 4
- d. Layer 7

Q1. Which of the following are types of flow control? (Choose all that apply.)

- a. Buffering
- b. Cut-through
- c. Windowing
- d. Congestion avoidance
- e. VLANs

Q1. If a hub has three computers connected to it, how many broadcast and collision domains is the hub creating?

- a. Three broadcast and one collision
- b. Three broadcast and three collision
- c. One broadcast and three collision
- d. One broadcast and one collision

Q1. What is the purpose of flow control?

- a. To ensure that data is retransmitted if an acknowledgment is not received
- b. To reassemble segments in the correct order at the destination device
- c. To provide a means for the receiver to govern the amount of data sent by the sender

- d. To regulate the size of each segment

Q1. A receiving host has failed to receive all of the segments that it should acknowledge.

What can the host do to improve the reliability of this communication session?

- a. Send a different source port number.
- b. Restart the virtual circuit.
- c. Decrease the sequence number.
- d. Decrease the window size.

Q1. When a station sends a transmission to the MAC address ff:ff:ff:ff:ff:ff, what type of transmission is it?

- a. Unicast
- b. Multicast
- c. Anycast
- d. Broadcast

Q1. Which layer 1 devices can be used to enlarge the area covered by a single LAN segment? (Choose two.)

- a. Switch
- b. NIC
- c. Hub
- d. Repeater
- e. RJ45 transceiver

Q1. Segmentation of a data stream happens at which layer of the OSI model?

- a. Physical
- b. Data Link
- c. Network
- d. Transport

Q1. Which of the following describe the main router functions? (Choose four.)

- a. Packet switching
- b. Collision prevention
- c. Packet filtering
- d. Broadcast domain enlargement
- e. Internetwork communication
- f. Broadcast forwarding

g. Path selection

Q1. Which three statements are true about the operation of a full-duplex Ethernet network?

- a. There are no collisions in full-duplex mode.
- b. A dedicated switch port is required for each full-duplex node.
- c. Ethernet hub ports are preconfigured for full-duplex mode.
- d. In a full-duplex environment, the host network card must check for the availability of the network media before transmitting.
- e. The host network card and the switch port must be capable of operating in full-duplex mode.

Q1. Which of the following is not a benefit of reference models such as the OSI model?

- a. It allows changes on one layer to affect operations on all other layers as well.
- b. It divides the network communication process into smaller and simpler components, thus aiding component development, design, and troubleshooting.
- c. It allows multiple-vendor development through standardization of network components.
- d. It allows various types of network hardware and software to communicate.

Q1. Which of the following devices do not operate at all levels of the OSI model?

- a. Network management stations (NMSs)
- b. Routers

- c. Web and application servers
- d. Network hosts

Q1. When an HTTP document must be retrieved from a location other than the local machine, what layer of the OSI model must be accessed first?

- a. Presentations
- b. Transport
- c. Application
- d. Network

Q1. Which layer of the OSI model offers three different modes of communication: simplex, half duplex, and full duplex?

- a. Presentation
- b. Transport
- c. Application
- d. Session

Q1. Routers operate at layer _____. LAN switches operate at layer _____. Ethernet hubs

operate at layer _____. Word processing operates at layer _____.

- a. 3,3,1,7
- b. 3,2,1,none
- c. 3,2,1,7
- d. 2,3,1,7
- e. 3,3,2,none

Q1. When data is encapsulated, which is the correct order?

- a. Data, frame, packet, segment, bit
- b. Segment, data, packet, frame, bit
- c. Data, segment, packet, frame, bit
- d. Data, segment, frame, packet, bit

Q1. Why does the data communication industry use the layered OSI reference model?

(Choose two.)

- a. It divides the network communication process into smaller and simpler components, thus aiding component development, design, and troubleshooting.
- b. It enables equipment from different vendors to use the same electronic components, thus saving research and development funds.
- c. It supports the evolution of multiple competing standards and thus provides business opportunities for equipment manufacturers.
- d. It encourages industry standardization by defining what functions occur at each layer of the model.
- e. It provides a framework by which changes in functionality in one layer require

changes in other layers.

Q1. What are two purposes for segmentation with a bridge?

- a. To add more broadcast domains
- b. To create more collision domains
- c. To add more bandwidth for users
- d. To allow more broadcasts for users

Q1. Which of the following is not a cause of LAN congestion?

- a. Too many hosts in a broadcast domain
- b. Adding switches for connectivity to the network
- c. Broadcast storms
- d. Low bandwidth