STRATHMORE UNIVERSITY
FACULTY OF INFORMATION TECHNOLOGY
MASTER OF SCIENCE IN INFORMATION SYSTEMS SECURITY
END OF SEMESTER EXAMINATION
MST 8101 - MOBILE COMPUTING

DATE: 17 April, 2018   **Time: 3 Hours**

Instructions: Answer Question <u>One</u> and any <u>Two</u> other Questions

Question 1

a. Referring to Fig. Q1a discuss how IP and MAC addresses are transformed on each link, if at all, when a message is sent from computer A to computer C and also when a packet is sent from computer B to computer C.
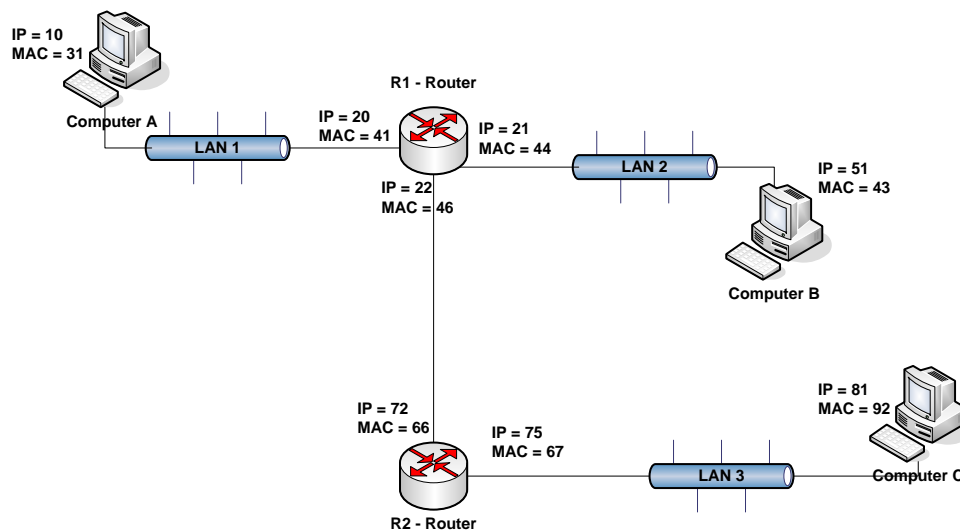

Fig. Q1a   [**10 Marks**].

b. Using a diagram showing the process of allocating IP parameters using DHCP on a network, explain how MAC address spoofing can disrupt services on the network   [**6 Marks**].

c. Use a diagram to illustrate the concept of DNS zone delegation for the following domain name: **elearning.strathmore.edu**   [**4 Marks**].

(**Total 20 Marks**)

Question 2

a. Using a diagram, explain how Address Resolution Protocol (ARP) is used in an Ethernet computer network   [**7 Marks**]

b. Using diagrams and tables discuss operation of NAPT in the following scenario: An internal network using the address 10.10.1.0/8 and connecting to a server on an external network using a gateway with public address 25.6.5.1. The server's IP address is 7.2.4.6 and offers services on port 80. Illustrate the processing of outgoing and incoming connections

[**8 Marks**].

(**Total 15 Marks**)

Question 3

    a. Discuss the importance of implementing Quality of Service in IP networks.   [**5 Marks**]

    b. Draw an outline diagram that depicts two mobile networks and use it to explain the concept of roaming.   [**5 Marks**]

    c. Discuss security challenges that may arise as a result of enabling roaming on mobile networks   [**5 Marks**].

(**Total 15 Marks**)

Question 4

    a. Use a diagram to illustrate the structure of a TCP header.   [**7 Marks**]

    b. With reference to the structure of an IP header illustrate how IP fragmentation is used and explain how an attacker can launch tiny fragment attacks with aim of bypassing a packet filtering firewall   [**8 Marks**].

(**Total 15 Marks**)