Tutorial 5: Ethernet

Q1. (a) In a Local Area Network, ARP request is a layer 2 broadcast messages. All the devices in the LAN received the Address Resolution Protocol (ARP) request except the sending device.

(i) What is the purpose of the ARP? (2 marks)

(ii) What is the action taken by a node if the node's IP address matched the IP address in the ARP request? (2 marks)

(iii) What happens if no device on the LAN responds to the ARP request? (2 marks)

(iv) Name and explain **ONE (1)** reason ARP can cause a problem in a network. (3 marks)

(v) What is ARP table used for? (4 marks)

(b) Determine the correct sublayer for the following descriptions. (6 marks)

Descriptions	**MAC or LLC?**
1. Controls the network interface card through software drivers	
2. Works with the upper layers to add application information for delivery of data to higher level protocols	
3. Works with hardware to support bandwidth requirements and checks errors in the bits sent and received	
4. Controls access to the media through signaling and physical media standards requirements	
5. Supports Ethernet technology by using CSMA/CD or CSMA/CA	
6. Remain relatively independent of physical equipment	

Q3. (a) Inspect the following MAC addresses; is this a proper MAC address? If no, why?

(i) 77:EE:33:AA:DD (2 marks)

(ii) 01-34-45-7U-8B-P9 (2 marks)

(iii) FI00:5678.910C (2 marks)

Tutorial 5: Ethernet

(b) In Ethernet, different MAC addresses are used for unicast, multicast, and broadcast communications. Give relevant example of MAC used in unicast, multicast, and broadcast delivery. (6 marks)

(c) Refer to the exhibit. 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? (6 marks)