University of Asia Pacific

Department of Computer Science and Engineering

Mid-Semester Examination Spring-2021

Program: B.Sc. in CSE

Course Title: Data Communication Course No. CSE 303 Credit: 3.00

Time: 1.00 Hour. Full Mark: 60

There are **Four** Questions. **Answer three questions including Q-1 and Q-2.**

1. a. **[15]**

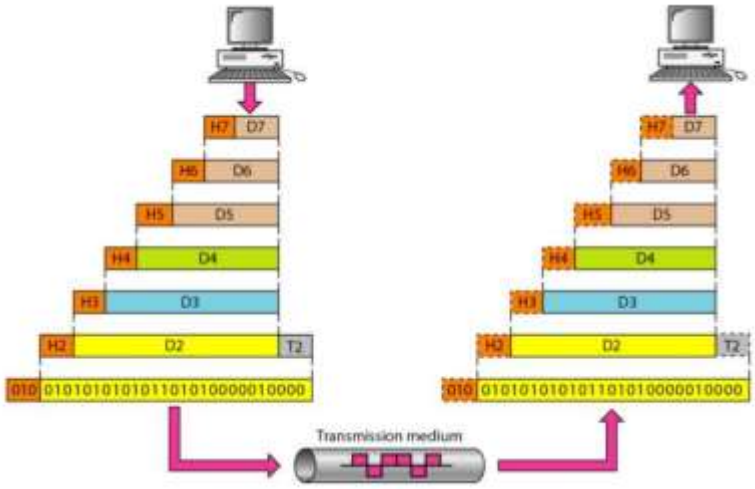

Figure 1 OSI layers

In OSI model, Data is represented by different formats and names starting from Application layer. It eventually turns into bits in the lowest layer and travels from sender to receiver and vice versa. Analyze, how Data encapsulates and decapsulates itself in different layers of OSI model starting from highest layer to the lowest layer with proper examples in each layer.

b. Suppose you want to communicate with your friend, and you have a channel with 1000 bps bandwidth. You can choose either half-duplex data flow or full-duplex data flow for your communication. Which one will you choose? Evaluate the reason behind your choice. **[5]**

2. a. You are creating an experimental setup with few network devices in your laboratory. Analyze the type of cable wiring you would consider between the following connections (A, B, C, D, E) so that a proper data communication occurs. Also, find out error if any, in the provided figure. **[10]**

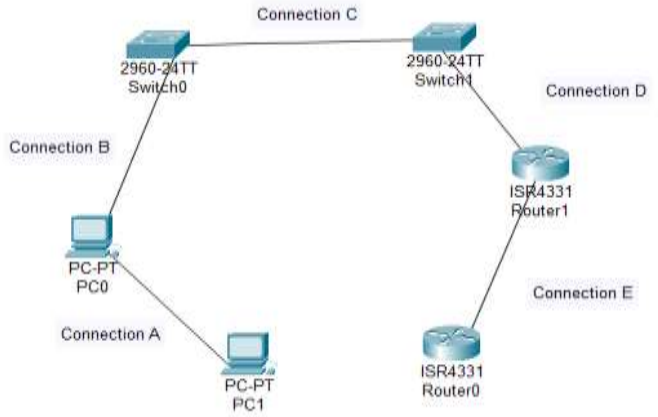

Figure 2 A simple Network topology

b. Suppose you want to measure the effectiveness of a data communication system that is running in your office. Illustrate the fundamental characteristics that needs to be considered during your measurement. **[10]**

3. a. Determine the type of the following destination addresses. You must show the detailed calculation for each one. **[3*2=6]**

i. 4C:30:10:21:1O:1A
ii. 49:20:1B:2E:08:EE
iii. F2:FF:FF:FF:FF:FF

b. The LAN market has seen several technologies such as Ethernet, Token Ring, Token Bus, FDDI, and ATM LAN. Some of these technologies survived for a while, but Ethernet is by far the dominant technology. In Standard Ethernet, the MAC sub layer governs the operation of the access method. It also frames data received from the upper layer and passes them to the physical layer. **[10+4=14]**

Draw a MAC frame and elaborate its different fields. Justify the reasons behind minimum and maximum length of a MAC frame?

OR

4. a. There are two ranges: **[10]**

192.168.0.0 - 192.168.255.255
193.168.0.0 - 193.168.255.255

Answer the following:

i) From your point of view, is there any significance of these two IP ranges?
ii) Mention key differences between these two ranges.

iii) Who owns 193.168.0.0 IP address? (you can use internet for searching)

b. "The physical addresses will change from hop to hop, but the logical addresses usually remain the same" -explain this statement with necessary facts and figures. **[10]**