Assignment 3: Chapter 2

Question 1

What are the 7 layers of OSI Network Model? Design a table representing:

- The layer names
- Functions of each layer
- Protocol Data Unit (PDU) of each layer

Question 2

Write the layer names that use Specific Address, IP (logical) address, Port address, and MAC (physical) address.

Question 3

Design a table representing the differences among Specific Address, IP address, Port address, and MAC address. Also provide an example of each.

Question 4

What are the sizes of a segment, a packet, and a frame?

Question 5

Transport layer and Data-Link layer both have the error and flow control functionalities. Find out the key differences between the error and flow control functionalities of these two layers.

Question 6

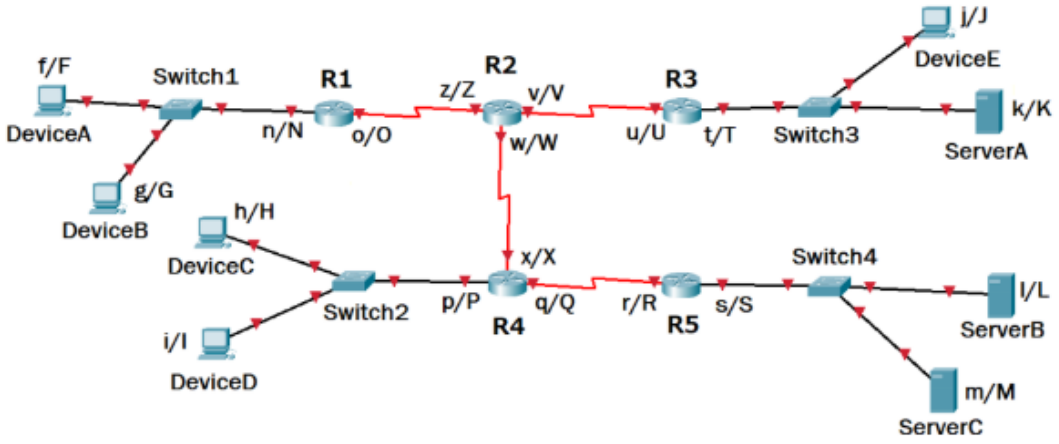
What do you understand by “De facto” and “De jure”?

Question 7

What do you understand by Protocols? What are the things that a protocol define?

Question 8

You have been tasked to work with the network topology shown below. Assume the physical addresses to be the uppercase letters and the logical addresses to be the lowercase letters. For the Devices, use a Port number from the dynamic range (49152 - 65535).



i. How many networks are there in total? What is a hop-to-hop delivery and which layer of the OSI model is responsible for maintaining this?

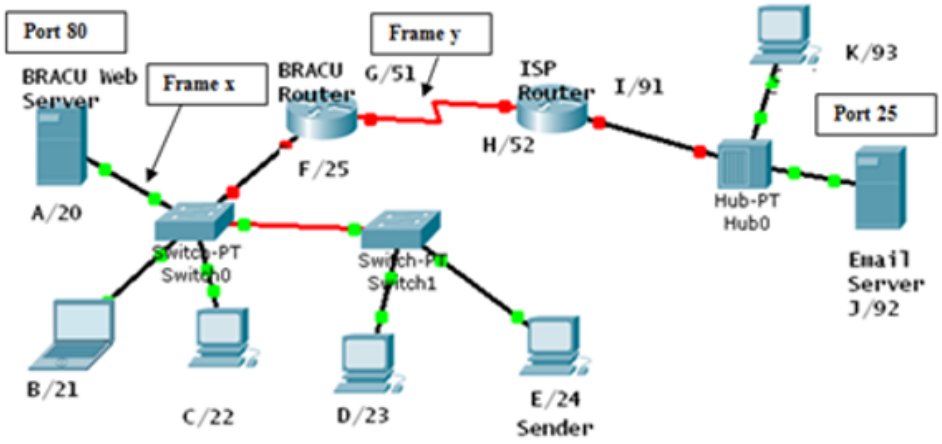
ii. Device E has a process running which is trying to receive a data frame from the web Server A. The Server is running at Port 80.

How many hops will there be? **Complete** Frame 1 below by writing the Destination and Source physical, logical and appropriate port addresses if the data frame is in its second hop.

Frame1	D. Mac	S. Mac	D. IP	S. IP	D. Port	S. Port	Data	Trailer

Question 9

Complete the frames (X & Y) given below with appropriate port, IP and MAC addresses. The sender Host E has two applications running; one for email with port number 57150 and the other for accessing the web server with port number 52044. The frame X is intended for the BRACU Web server and frame Y is coming from the Email Server. (MAC addresses are alphabets and IP addresses are numbers)



Frame X

S. MAC	D.MAC	S.IP	D.IP	S.Port	D.Port	Data	Trailer

Frame Y

S. MAC	D.MAC	S.IP	D.IP	S.Port	D.Port	Data	Trailer

Question 10

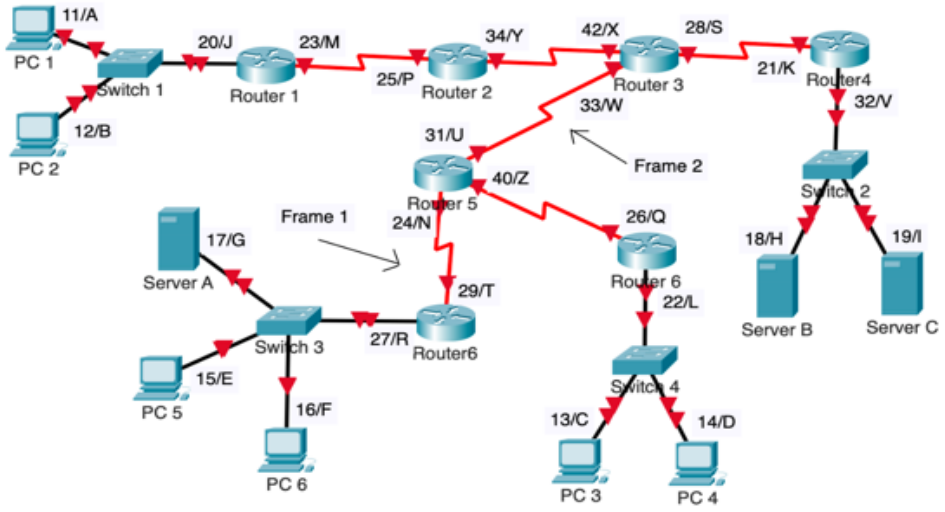
Identify the name of the **TCP/IP model** layers based on the following functionalities.

- Enables resource sharing and remote file access among network users.
- Responsible for converting data into signals for transmission over a physical medium.

- Responsible for establishing and terminating communication sessions.
- Ensure reliable hop to hop transmission.

Question 11

Consider the network topology shown below. Assume the physical addresses to be the uppercase letters and the logical addresses to be the numbers. For the Devices, use a Port number from the dynamic range (49152 - 65535).



i. How many networks are there in total?

ii. Data is coming from Server B which uses port number 23 and it is intended for PC6. Considering this situation, **complete** Frame 1 below by writing the appropriate Destination and Source Physical, Logical and Port Addresses.

iii. PC1 is trying to send a data to Server A, which is an Email Server using port 25. Considering this situation, **complete** Frame 2 below by writing the appropriate Destination and Source Physical, Logical and Port addresses.

	D. Mac	S. Mac	D. IP	S. IP	D. Port	S. Port		
Frame 1							Data	Trailer

	D. Mac	S. Mac	D. IP	S. IP	D. Port	S. Port		
Frame 2							Data	Trailer