

Department of Electrical Engineering
Mid – Term Assignment Spring 2020
Date: 20/04/2020

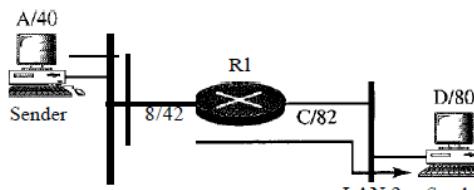
Course Details

Course Title: Advance Computer Networks
Instructor: _____

Module: _____
Total Marks: _____ 30

Student Details

Name: Muhammad Irfan Khattak **Student ID:** 15634

Q1.	<p>(a) 1. A color image uses 16 bits to represent a pixel. What is the maximum number of different colors that can be represented?</p> <p>2. Assume six devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device?</p> <p>3. For each of the following four networks, discuss the consequences if a connection fails.</p> <ul style="list-style-type: none"> a. Five devices arranged in a mesh topology b. Five devices arranged in a star topology (not counting the hub) c. Five devices arranged in a bus topology d. Five devices arranged in a ring topology <p>4. Performance is inversely related to delay. When you use the Internet, which of the following applications are more sensitive to delay?</p> <ul style="list-style-type: none"> a. Sending an e-mail b. Copying a file c. Surfing the Internet <p>5. Match the following to one or more layers of the OSI model:</p> <ul style="list-style-type: none"> a. Route determination b. Flow control c. Interface to transmission media d. Provides access for the end user 	Marks 15
Q2.	<p>(a) In the following Figure, computer A sends a message to computer D via LAN1, router R1, and LAN2. Show the contents of the packets and frames at the network and data link layer for each hop interface.</p> 	Marks 05
Q3.	<p>(a) In the above Figure, assume that the communication is between a process running at computer A with port address i and a process running at computer D with port address j. Show the contents of packets and frames at the network, data link, and transport layer for each hop.</p> <p>Dialog control and synchronization are two responsibilities of the session layer in the OSI model. Which layer do you think is responsible for these duties in the Internet model? Explain your answer.</p>	Marks 05

Ans (a) 1. For 16 bits, 2^{16} different colors can be represented.

(2). For six devices, the arrangement of cables and ports needed for each devices are as under;

$$\text{Cable links} = \frac{6 \times 5}{2} = 15 \checkmark$$

$$\text{Number of ports} = (n-1) = 6-1 = 5 \checkmark$$

(3). Mesh topology

If one connection fails, the other connections will still be working.

Star topology

The other devices will still be able to send data through the hub, there will be no access to the device which has the failed connection to the hub.

Bus topology

All transmission stops if the failure is in the bus. If the drop line fails only corresponding device can't operate.

Ring topology

The fail connection may disable the whole network unless it is a dual ring or there is a bypass mechanism.

(4) a) E-mail is not an interactive application. Even if it is delivered immediately, it may stay in the mail box of the receiver for a while. It is not sensitive to delay.

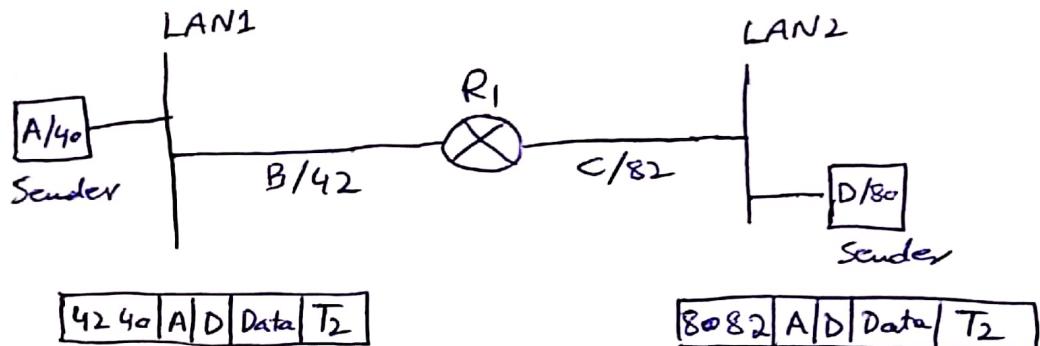
b) We normally do not expect a file to be copied immediately. It is not very sensitive to delay.

C Surfing the internet is the application very sensitive to delay. We expect to get access to the site we are searching.

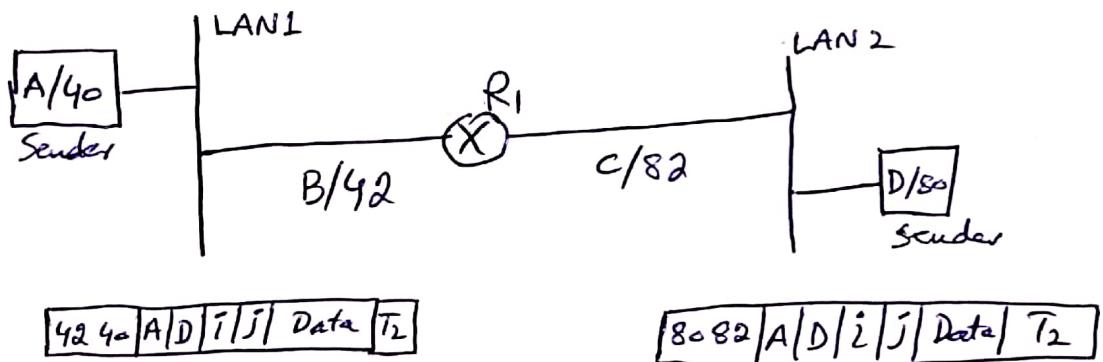
5.

- (a) Route determination (Network layer)
- (b) Flow control (Data link & transport layers)
- (c) Interface to transmission media (Physical layer)
- (d) Access to the end user (Application).

Ans 2 (a)



(b)



Ans 3(a). The TCP/IP protocol suite is also known as internet model. It was developed prior to the OSI Model. When the internet model is compared to OSI, we can say that host to network layer is equivalent to the combination of physical & Data link layer. The internet layer is equivalent to the network layer and the application layer is doing the job of the session layer, presentation & application layers with the transport layer in TCP/IP taking care of part of the duties of the session layer.

PAGE 2