Department of Electrical Engineering
Mid – Term Assignment Spring 2020
Date: 13/04/2020

Course Details

Course Title: Computer Communication Network   **Module:** 06

Instructor: _____   **Total Marks:** 30

Student Details

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Q1.	(a)	1. _____ topology has unidirectional movement of traffic. 2. Set of rules that govern communication is called _____ 3. _____ of a network is the frequency of failure and network recovery time after a failure is measured. 4. ASK, PSK, FSK and QAM are all examples of _____ modulation. 5. Data synchronization is a function related with _____ layer. 6. The _____ layer changes bits into electromagnetic signals. 7. The information to be communicated in a network is called the _____. 8. _____ topology requires the maximum number of I/O ports. 9. A signal that repeats itself is a _____ signal. 10. A 56k modem can download at a rate of _____ Kbps and upload at a rate of _____ Kbps. 11. In mesh topology, if there are five nodes then there will be _____ links. 12. When data is transmitted from device A to device B using internet model, the header from A's layer 4 is read by B's _____ layer. 13. A _____ device will convert an analog signal to a digital signal. 14. _____ is the collection of all the component frequencies.	Marks 14 CLO 1
Q2.	(a)	1. How are frames different from packets? Explain with examples. 2. A phone line being analog can we send digital data on phone lines? Support your answer with examples. 3. Give some details about fault tolerance, which network topologies have fault tolerance capability? 4. How is logical addressing different from physical addressing? Support your answer with examples. 5. A local telephone company wants to connect the LANs in all its offices throughout a city. For this case which network category would be used?	Marks 10 CLO 1
Q3.	(a)	Consider the following network, how many hops will it require for data to reach from node A to node J.	Marks 04 CLO 1

| (b) | A Sine wave has a frequency of 135 Hz. What is its period? | Marks 02 |
| | | CLO 1 |

Ans: 1

1. Ring topology
2. Protocol
3. Reliability
4. Digital
5. Physical layer
6. Physical layer
7. message
8. mesh topology
9. Periodic signal
10. Download rate = 56.6 Kbps
    Upload rate = 33.6 Kbps
11. $10 \quad \dfrac{n(n-1)}{2}$
12. Transport layer
13. Analog to digital converter (ADC)
14. Frequency spectrum

Ans.2 @ ①

Frame: An information unit whose
Source and destination are data
Link layer entities.

It is the data which is a
collection of bits by adding special
characters before and after the
transmited data.

Example:

A particular example of a frame
is Ethernet frame.

Ethernet frame are of varying
length with no frame layer lesser
than 64 octets or greater than
158 octets.

Packet: A Packet is the protocol
data unit used in the network
layer. As the primary function of
the network layer is to deliver a
a packet from one logical address
(IP) to another.

Examples: An enormous file is Broken into many Packets and then transmitted across network one at a time. The network hardware conveys the packet to the certain destination where a Software re gather them into a Single file.

Ans② ② Yes, we can send digital data on phone lines. Telephone lines carry digital data all the time.

Modem is short for modulator/demodulator. It Superimposes your data on carrier. i.e it modulates your signal so that it can be carried in the telephone lines. Modem does not perform Analog digital conversion. It is the job of Analog to digital converter.

Example:
when we talk on a telephone the microphone operates as a transmitter. when we are talking it produce Analog signal that travels to the central office.

Here the Signal Switches to another local destination or other Switching offices that connect it to a remote destination. At the central office the telephone company will digitize the analog Signal to Switch it across the telephone network.

Ans ② ③ Fault tolerance:

It refers to the ability of a System to continue operating without interruption when one or more of its components fail.

→ Mesh topology has fault tolerance capability. Even if one of the components fails there is always an alternative present. So data transfer does not affected.

Ⓖ Addresses uniquely identifies a location in the memory. we have two types of addresses, that are logical addressing and physical addressing.

→ The logical address is virtual address and can be viewed by the user.

→ The user can not view the physical address directly.

→ The logical address is used like a refrence to access the physical address.

→ The fundamental difference b/w logical and physical addresses is the logical address is generated by cpu during program execuation and physical address refers to the location in the memory unit.

Example:
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Your computer ethernet card's physical address is its MAC address and your logical address is your IP address.

Ans (2)

3) LAN is designed for small physical areas such as an offices, group of buildings or a factory. LANS are widely used as it is easy to design and to trouble shoot. Personal computers and work stations are connected to each other through LANS.

We can use different types of Topologies through LAN. These are Star, Ring, Bus etc. Ring network is better to use with LAN in offices.

Ans ③ ⓐ
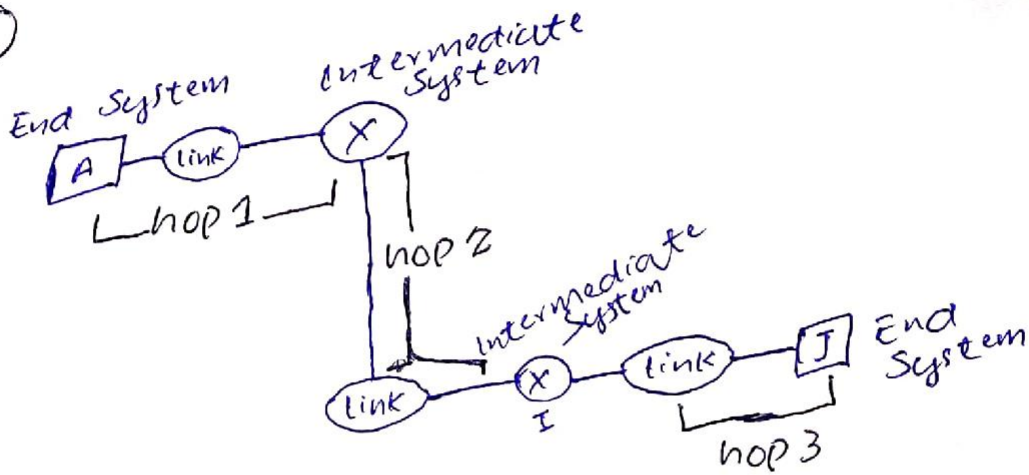
It will require 3-hops for data to reach from node A to node J

HOP: In computer networking including the internet, a hop occurs when a packet passed from one network segment to the next.

Ans ③ ⓑ Given data:

Frequency = 135 HZ

Required:

Time period = T

Solution:

$$T = \frac{1}{f}$$

$$T = \frac{1}{135} = \begin{array}{c} 0.0074 \text{ s} \\ \text{or} \\ 7.4 \text{ ms} \end{array} \quad \text{(Answer)}$$