

**Department of Electrical Engineering  
Mid – Term Assignment Spring 2020**

Date: 13/04/2020

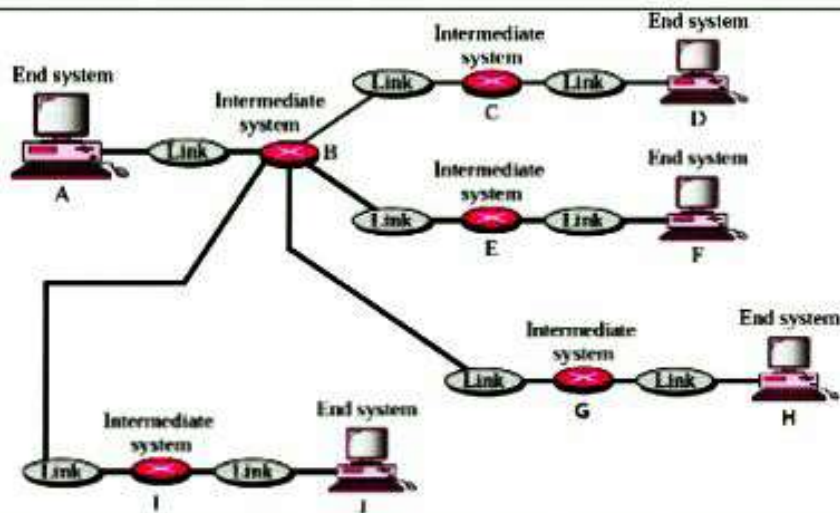
**Course Details**

<b>Course Title:</b>	<u>COMPUTER COMMUNICATION NETWORK</u>	<b>Module:</b>	<u>06</u>
<b>Instructor:</b>	<u>SIR MUHAMMAD WAQAS</u>	<b>Total Marks:</b>	<u>30</u>

**Student Details**

<b>Name:</b>	<u>RIMSHA KHAN</u>	<b>Student ID:</b>	<u>13672</u>
--------------	--------------------	--------------------	--------------

Q1	(a)	<ol style="list-style-type: none"> <li>1. _____ topology has unidirectional movement of traffic.</li> <li>2. Set of rules that govern communication is called _____</li> <li>3. _____ of a network is the frequency of failure and network recovery time after a failure is measured.</li> <li>4. ASK, PSK, FSK and QAM are all examples of _____ modulation.</li> <li>5. Data synchronization is a function related with _____ layer.</li> <li>6. The _____ layer changes bits into electromagnetic signals.</li> <li>7. The information to be communicated in a network is called the _____.</li> <li>8. _____ topology requires the maximum number of I/O ports.</li> <li>9. A signal that repeats itself is a _____ signal.</li> <li>10. A 56k modem can download at a rate of _____ Kbps and upload at a rate of _____ Kbps.</li> <li>11. In mesh topology, if there are five nodes then there will be _____ links.</li> <li>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.</li> <li>13. A _____ device will convert an analog signal to a digital signal.</li> <li>14. _____ is the collection of all the component frequencies.</li> </ol>	<b>Marks</b> 14 CLO 1
Q2	(a)	<ol style="list-style-type: none"> <li>1. How are frames different from packets? Explain with examples.</li> <li>2. A phone line being analog can we send digital data on phone lines? Support your answer with examples.</li> <li>3. Give some details about fault tolerance, which network topologies have fault tolerance capability?</li> <li>4. How is logical addressing different from physical addressing? Support your answer with examples.</li> <li>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?</li> </ol>	<b>Marks</b> 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.	<b>Marks</b> 04 CLO 1



(b )

A Sine wave has a frequency of 135 Hz. What is its period?

Marks  
02

CLO 1

## PAGE 1

Attempt all the questions.

Q1 Fill in the blanks. "Question 1"

- 1, Ring topology has unidirectional movement of traffic.
- 2, Set of rules that govern communication is called Protocol.
- 3, Reliability of a network is the frequency of failure and network recovery time after a failure is measured.
- 4, ASK, PSK and FSK, QAM are all examples of Digital modulation.
- 5, Data Synchronization is a function related with Session layer.
- 6, The Physical layer changes bits in to electromagnetic signals.
- 7, The information to be communicated in a network is called the Message.
- 8, Mesh topology requires the maximum number of I/O ports.
- 9, A signal that repeats itself is a Periodic signal.
- 10, A 56k modem can download at a rate of 56 Kbps and upload a rate of 33.6 Kbps.
- 11, In mesh topology, if there are five nodes then there will be 10 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 transport layer.
- 13, A Analog to digital converter (ADC) device will convert an analog signal to a digital signal.
- 14, Frequency Spectrum is the collection of all the component frequencies.

## "Question 2"

Number 1:-

Q How are frames different from packets?  
Explain with example?

Differences:-

Basic difference	FRAMES	PACKET
1, Definition	A frame can be defined as a data unit used in data link layer. A frame consist of markers which depicts the start and end of the packet and address for sending and receiving.	A packet is a protocol data unit used in the network layer is to delivers a packet from one logical address to other.
2, Basic	Frame is the data link layer protocol data unit.	Packet is the network layer protocol data unit.
3, Associated layer	Data link layer	Network layer
4, Includes	Source and destination MAC address.	Source and destination IP address.
5, Correlation	Segment is encapsulated within a packet.	Packet is encapsulated within a frame.
6, Contain	It contain logical address information.	It contain physical address information.

**Example :-**

**Frame :-**

Ethernet frames, point to point protocol frame, fibre channel frame, V.42 modem frame.

**Packet :-**

Network packets, IP packets, Control packets.

**Number 2 :-**

Q A phone line being analog can we send digital data on phone lines? Support your answer with example?

**Answer :-**

Telephone lines carry digital data all the time. Modem superimposes the data on a carrier, it modulates the signal so that it can be carried in the telephone lines. The modem allows the computer to communicate with other computers by converting digital signal or communication into analog format, so they can travel through public phone network. But there is a limit to the amount of information a common analog telephone line can hold. This limit is 56 Kbps. When the telephone company reverses the process and digitizes an analog signal, it uses a 64 Kbps channel. One of these channels is called DS0 (digital signal level zero), is the basic building block for digital telephone processes. The commonly used T1 lines is a DS1 channel. With synchronization bits after each 192 bits (that is 8000 times a second) the DS1 capacity is 1.544 Mbps.

**Example :-**

A digital telephone line or a digital trunk is a type of telephone line that carries voice or data by using digital sampling. It converts analog signal into digital to allow for more information to be transferred over a single connection.

**Number 3 :-**

Q Give some detail about fault tolerance, which network topologies have fault tolerance capability?

**Fault tolerance :-**

Fault tolerance is the property that enables a system to continue operating properly in the event of the failure of some of its components.

**Explanation :-**

If the operating quality of fault tolerance decreases at all, the decrease is proportional to the severity of the failure. Fault tolerance is particularly sought after in a high-availability or life-critical systems. A fault tolerance design enables a system to continue its intended operation, possibly at a reduced level, rather than failing completely, when some part of a system fails. So that is the system as a whole is not stopped due to problems either in the hardware or software.

**Example :-**

A twin-engine airplane is a fault tolerant system, if one engine fails, the other one kicks in allowing the plane to fly. Similarly a car with a spare tire is highly available. A flat tire will cause the car to stop, but downtime is minimal because the tire can be easily replaced.

## Network topologies :-

"Mesh" network topology has a fault tolerance network capability.

## Number 4 :-

Q How is logical addressing different from physical addressing? Support your answer with examples?

### Answer:-

1,

Logical address is the address that is generated by C.P.U., whereas physical address is a location that exists in the memory.

2,

Logical address space is the set of all logical address generated by C.P.U for a program whereas physical address space is the set of all physical address mapped to corresponding logical address.

3,

The physical address is an accessible physical location existing within the memory whereas logical address exist virtually and does not have a specific location.

4,

Logical address generated by C.P.U while physical address is computed by (MMU) memory management unit.

5,

Physical and logical address are same in compile-time and load-time addressing-binding schemes.

6,

The logical address is flexible hence will keep changing with the system but the physical address of that object always remain constant.

7,

The user can use the logical address to access the physical address whereas the user can indirectly access the physical address but not directly.

### Number 5 :-

Q 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?

Ans A metropolitan Area Network (MAN) is a computer resources in a geographic region of size of a metropolitan area.

The term (MAN) is applied to a interconnection of local area network (LAN) in a city into a single larger network which may then also offer efficient connection to a wide area network.

The term is used to describe the interconnection of several local area network in a (MAN) through the use of point to point connection between them.

If topology is required then "star" topology is best for this.



## "QUESTION 3"

## Part A:-

Q Consider the following network how many hops will it require for data to reach from node A to node J.

Ans For this network 3 hops are required for data to reach from point A to J.

1, One hop is between A to B.

2, Second hop is between B to I.

3, Third hop is between I to J.

## Part B:-

Q A sinwave has a frequency of 135 Hz. What is its period?

Solution:-

$$F = 135 \text{ Hz}$$

$$\text{Time period} = T = ?$$

Formula + Solution:-

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

$$T = \frac{1}{135}$$

$$T = 0.0074 \text{ sec}$$

$$\text{Period} = 0.0074 \text{ sec}$$