# Department of Electrical Engineering
# Mid – Term Assignment Spring 2020
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## Course Details

**Course Title:** Computer Communication Network **Module:** 06
**Instructor:** Engr Waqas Khan **Total Marks:** 30

## Student Details

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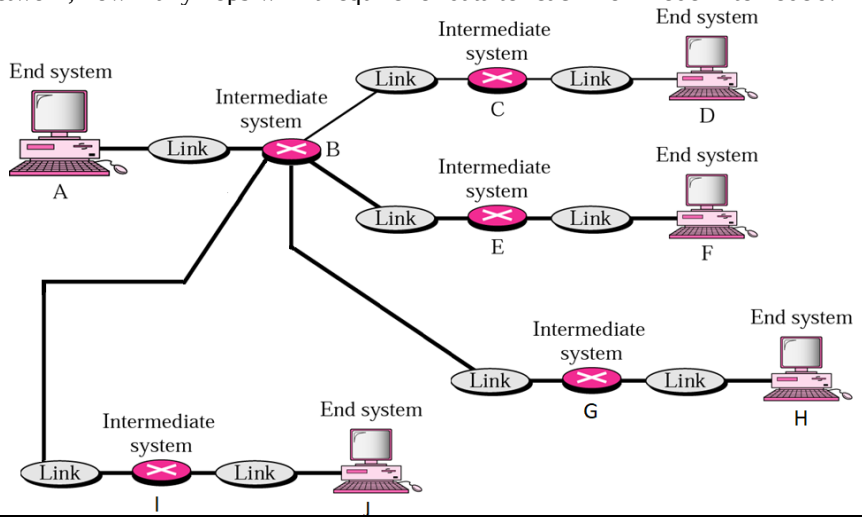
|---|---|---|
| | (a) | 1. _____ topology has unidirectional movement of traffic.<br>2. Set of rules that govern communication is called _____<br>3. _____ of a network is the frequency of failure and network recovery time after a failure is measured.<br>4. ASK, PSK, FSK and QAM are all examples of _____ modulation.<br>5. Data synchronization is a function related with _____ layer.<br>6. The _____ layer changes bits into electromagnetic signals.<br>7. The information to be communicated in a network is called the _____.<br>8. _____ topology requires the maximum number of I/O ports.<br>9. A signal that repeats itself is a _____ signal.<br>10. A 56k modem can download at a rate of _____ Kbps and upload at a rate of _____ Kbps.<br>11. In mesh topology, if there are five nodes then there will be _____ links.<br>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.<br>13. A _____ device will convert an analog signal to a digital signal.<br>14. _____ is the collection of all the component frequencies. |
| | (a) | 1. How are frames different from packets? Explain with examples.<br>2. A phone line being analog can we send digital data on phone lines? Support your answer with examples.<br>3. Give some details about fault tolerance, which network topologies have fault tolerance capability?<br>4. How is logical addressing different from physical addressing? Support your answer with examples.<br>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? |
| | (a) | Consider the following network, how many hops will it require for data to reach from node A to node J.<br>  <br> |
| | (b) | A Sine wave has a frequency of 135 Hz. What is its period? |

Q No 1)

i) Ring Topology has Unidirectional movment of Traffic

ii) Set of rules that govern Communication is Called Protocol

iii) Reliability of a network is the frequency of failure and network recovery time after a failure is measured

iv) ASK, PSK, FSK and QAM are all example of digital modulation

v) Data Synchronization is a function related With Data layer

vi) The Physical layer Changes bits into electromagnetic Signal

vii) The information to be Communicated in a network is called the Data Communication

viii) Mesh Topology topology requires the maximum numbers of I/O Ports

ix) A Signal that repeats itself is a Periodic Signal

x) A 56K modem can download at a rate of 56.6 KbPs and upload at a rate of 33.6 KbPs

xi) In mesh topology, If there are five nodes then there will be 10 links.

xii) 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

xiii) A analog-to-digital Convert or ADC device will Will convert an analog signal to a digital signal

xiii) Frequency Spectrum is the Collection of all Component frequencies

Q No 2).

How are frames diffrent from Packets? Explain with examples.

The difference b/w frame and Packet is that frame is the serial collection of bits, and it encapsulates Packets whereas Packets are the fragmented from of data and in encapsulates segment.

Data link layer Perform framing Process, on the other hand network layer Perform fragmentation of the data and Create Smaller Chunks known as Packet.

Another major difference is that a frame includes device's MAC adress while a Packet include device's IP address

Example:

For example. In the Ethernet Protocol on the Physical layer (layer1) the unit of

data is called "Ethernet Pocket" which has an Ethernet frame (layer 2) as its Payload. But the unit of data of the network layer (layer 3) is also called a "Packet"

iv A Phone line being analog can we send digital data on Phone lines? support your answer with example.

Ans: Yes

Our modem allows our computer to communicate with other computer by converting digital communication into analog format. So they can travel through the Public Phone network, But there's a limit to the amount of information a common analog telephone line can hold. This limit is about 56 Kbps, although very few telephone modem combination ever really operate at anything near that rate.

When the telephone company reverses the process and digitizes an analog signal, it uses a 64Kbps channel. (This is a worldwide standard) one of these channels, called a DS0. The basic building block for digital telephone process. You can combine 24 DS0 into a DS1. The commonly

Used T1 line is a DS1 Channel with Synchronization bits after each 192 bits (that is 8000 time a Second), the DS1 capacity is 1.544 Mbps.

3)

Give Some details about fault tolerance, Which network topologies have fault tolerance capability

Ans:- Fault tolerance refers to the abilty of a network to continue operating without interruption when one or more of its component fail. Fault-tolerant technology is a capability of a Computer System electronic System or network to deliver uninterrupted Service, despite one or more of its Compnent faling. Fault tolerance also resolve Potetional Service interruption related to Software or logic errors. The Purpose is to Prevent catastrophic failure that could result from a Single Point of failure.

The mesh topology Provids fault tolerance by having Separate cable for each Connection, allowing any one cable to break without interferring with the rest of the network

4) How is logical addressing different from Physical addressing? With example

Ans: The Physical address is also referred as the MAC address. This address never changes it is burned into a chip on the network interface card. All devices on a network will have a MAC address unique only to that device. Layer 2 of the OSI model The logical address is the layer 3 address that is assigned to a device. This address is subject to change depending on what network the device is added to. Its also called IP address.

Example:

For example, If your desktop Computer has a network interface card in it, The NIC has a Physical address Permanently stored in a special memory location This Physical address also called the MAC address. MAC has two Parts, each 3 bytes long. The first 3 bytes identify the Company that made the NIC. The second 3 bytes are the Serial number of the NIC itself.

5) A Local telephone Company Want to Connect the LAN in all its offices throughout a City. For this case Which network Category would be used.

Ans:. WAN is used for Connecting the offices Because WAN network System Could be a Connection of a LAN Which Connect With other LAN's using telephone lines and radio waves. It is mostly limited to an enterprise or an organization a WAN. In IP networking the router maintains both a LAN address and WAN address.

Q No 3) (a)

Consider following network how many hope will it require for data to reach from Node A to node J.

Ans:.

Total hopes = 3

1) Hope 1 = from A → B (As I marked in fig)
2) Hop 2 = from B → I (As is marked in fig)
3) Hop 3 = from I → J (As is marked in fig)

Q No 3 (b)

A Sine Wave has a frequency of 135 Hz What is its Period

Ans:. F = 135 Hz

T = ?

F = 1/T

T = 1/F

T = 1/135

T = 0.0074 S