

Department of Electrical Engineering

Assignment

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Course Details

Course Title:
Instructor:

Data Com & Comm.
Eng. Zubair

Module:
Total Marks:

6th Semester.

Student Details

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Part A (Objective Type)

- _____ is the regulation of the amount of data that can be sent.
 - Line Discipline
 - Flow Control
 - Error Control
 - All of the above
- Forty-five physical channels link _____ devices arranged in a mesh topology.
 - Nine
 - Ten
 - Twelve
 - Fifteen
- Signals reflection at the taps can cause signal degradation in a _____ topology.
 - Ring
 - Bus
 - Mesh
 - Star
- _____ layer allows a process to add synchronization points into stream of data.
 - Network
 - Transport
 - Presentation
 - Session
- If the maximum value of a simple sine wave is 10 volts, the minimum value is -10 volts.

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- a. 10
 - b. 5
 - c. Square root of 10
 - d. -10
6. Choose the correct association between a device and its functionality
- a. Computer Printer
 - b. CPU Input
 - c. LCD Input
 - d. Modem Modulation and Demodulation

Fill in the Blanks

7. Baud rate is always less than or equal to Bit rate.
8. Stop-and-wait is a contacted device technique. \rightarrow Flow control.
9. A contacted device is uniquely identified by an IP address and a port number.
10. In Application layer of TCP/IP model port address are defined.

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Part B (Subjective Type)

Q1 In terms of OSI Model please explain the role of Shayan, Tariq, Nawaz and Danish below with proper examples.
(5)

Sender	Receiver
Andy	Application layer
Parvez	Presentation layer
Shayan	Session layer
Tariq	Transport layer
Nawaz	Network layer
Danish	Data link layer
Paul	Physical layer

(b) Data is independent of signal levels and it cannot achieve data higher than channel capacity. Please elaborate this statement. (5)

Q2 Sometimes the sender sent the information to the receiver but the receiver does not receive the exact information which sender sent to it. How to overcome this problem?? (5)

Q3 For transmitting huge amount of data over long distances which type of technique we usually use? Explain with the help of example. (5)

Ans 01
*

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OSI Model::

(011)

The OSI model
interconnection there are seven OSI model.

- 1) Application Layer
- 2) Presentation Layer
- 3) Session Layer
- 4) Transport Layer
- 5) Networking Layer
- 6) Data Link Layer
- 7) Physical Layer

* OSI Model Story.

As there is a company in Mardan in (71 employees) works in this company.

(a) Role of Andy

Pervez Andy is a head of firm and owner of this company and he only understand (Finance and Twilkey) language.

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(02)

* Paviz.

Andy said to Paviz these are 400 pages documents and these 400 pages transform to Arabic Company Karachi. Paviz received 400 pages of documents and see the documents written in Pushtoy Language. So if the Company are not understand in Pushtoy Language, and if this situation if the company understand only English so the company will transfered these documents to Taxis.

* Taxis.

if Taxis have receive the documents of Masdar Karachi Company. So Taxis will call and said your company will open he said what time open and close time they told 8am to 8pm. and Taxis send a documents arrive at your company. when you received this file then call me.

* Shayan ::

Pavie Handled the documents to shayan - when shayan received the documents - he said this file is more very important. and its all record our company. then this 400 pages divided of four bundles 100 pages of each bundle. if in this 4 bundles one bundle will loss. So the other 3 will remaining.

* Nawaz ::

if shayan handled the four bundle of each bundle have 100 pages. and send to nawaz. Nawaz will put the address (to inform) on these bundles.

* Danish.

Nawaz give these documents to Danish. if danish received these 4 bundle documents. and say it its secrets no one see it.

① *

Paul

if Paul handle the documents from to Danish. Danish told him go fast and safe the documents must handled to Karachi reception department (Physical Layer).

* Application of Layer.

the user (software) to access the network. its enable

- ↳ Network vertical terminal.
- ↳ File transfer and management.
- ↳ Email services.
- ↳ Directory services.

* Presentation Layer.

with the syntax and semantics of the exchange between two systems.

- ↳ Transform, Compression.

* **Session Layer.**

Daily Control.

* Function

Sychuonisation.

* **Transport layer.**

Responsible for

Process delivery.

Function

→ Service Point addressing

→ Segmentation and responsible.

* **Network Layer.**

Responsible for

for source ~~location~~ destination

delivery of packet.

function.

Logical addressing, routing.

* **Data Link Layer.**

Transform the physical

Layer into reliable line

function.

framing,

Physical addressing.

Flow control,

error control,

access control,

* Physical Layer.

The Physical Layer transmission between different devices and electrical or mechanical interface connecting to the physical medium is synchronized.

Q:02 Part B

Data is Independent of Signal levels.

The few reason of data is independent of signal levels.

* Noisy channel.

For a noiseless channel the narrowest bit rate formula defines the theoretical maximum bit rate.

$$\text{Bit rate} = 2 \times \text{bandwidth} \times \log_2 L$$

In this formula bandwidth is the the channel "L" is the # signal of levels used to represent data and bit rate per second.

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According to the formula we might think a specific bandwidth we have bit rate we want by increasing the number. Signal is just too complicated to distinguish by level order and increasing signal by level order will increase reliability of system.

* Noisy channel.

In reality we have not a noisy channel. It is always noisy. In 1949 Claude (Shannon Capacity) determined critical high data rate.

$$\text{Capacity} = \text{Bandwidth} \times \log_2(1 + \text{SNR})$$

In this formula the bandwidth is SNR channel signal to noise ratio and Capacity of the channel per second.

* That is Shannon formula.

Q02

Ans: when the sender send data to the receiver but the receiver doesnot receive complete data and information as they are meaning - full b/c its produce in a mid are any where distorction due to following

- reason
- i Signal distorction.
 - ii Signal attenuation.
 - iii Noise

* Signal distorction.

The minimize this loss effect by using error detection and a correction Schemes.

* Signal Attenuation ..

To Compess the signal attenuation loss - amplifiers are used to amplify the signal.

(*) Noise ::

it is be a distortion from the sender to the receiver. noise is a spike and from power line lighting using high quality medium signal like a fibre optic it is minimized this effect.

Ans
03

Transmitting high amount of data over long distance we were used different techniques.

i High Bandwidth ::

The fibre optics cable is support dramatically higher bandwidth and hence data rate and bandwidth utilization over fibre optic cables are limited not by the medium but by the signal generation and reception technology available.

*2 Light weight.

are much lighter than a copper cable. fiber optic cable

3 Resistance to Corrosive material.

Glass is more resistant to corrosive material than a copper metal.

4 Less Signal attenuation.

Transmission distance is a significantly greater than other media. A signal can travel for 50 km without receiving regeneration we need repeaters every 5 km for 'Coaxial' or Twisted pair cable.

(5) Immunity to Electromagnetic Interference.

The Electromagnetic noise Connect
effect Fiber-optic Cable.

(6) Greater immunity to Tapping.

Fiber-optic Cable are more
immune to tapping the
Copper Cables create antenna
effect that can be
easily Tapped.

THE

END.