

**Department of Electrical Engineering**  
**Assignment**  
**Date: 14/04/2020**

---

**Course Details**

**Course Title:** Data and Computer Communication

**Module:** \_\_\_\_\_ **Instructor:** Engr.Zulqarnain **Total Marks:** \_\_\_\_\_

---


**Student Details**

**Name:** Mohammad Usama **Student ID:** 14150


---

**Part A (Objective Type)**


1. \_\_\_\_\_ is the regulation of the amount of data that can be sent.

- a. Line Discipline
-  b. **Flow Control**
- c. Error Control
- d. All of the above


2. Forty-five physical channels link \_\_\_\_\_ devices arranged in a mesh topology. a. Nine

-  b. **Ten**
- c. Twelve
- d. Fifteen


3. Signals reflection at the taps can cause signal degradation in a \_\_\_\_\_ topology.

- a. Ring
-  b. **Bus**
- c. Mesh
- d. Star

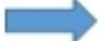
4. \_\_\_\_\_ layer allows a process to add synchronization points into stream of data.

- a. Network
- b. Transport
- c. Presentation
-  d. **Session**

5. If the maximum value of a simple sine wave is 10 volts, the minimum value is \_\_\_\_\_ volts.

- 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 **THE BIT** rate.
- 8. Stop-and-wait is a **FLOW CONTROL** technique.
- 9. A **CONTACTED DEVICES** is uniquely identified by an IP address and a port number.
- 10. In **APPLICATION** layer of TCP/IP model port address are defined.

①

M-U Same

ID # 14150

Q In The Term of OSI model by Rule of shahn, Tariq, Nawaz and Danish below with proper examples.

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

⇒ OSI Model :-

open system interconnection.

↳ There are seven layers in OSI model.

- (1) Application Layer - (5) Network Layer.
- (2) Presentation Layer - (6) Data link Layer.
- (3) Session Layer - (7) Physical Layer.
- (4) Transport Layer

⇒ Story of OSI model -

① It's a company based in "Banku" and "seven" employ work in the company -

② Role of Andy :-

Head officer of the

company is Andy and He only understand the 'French' language.

③ Role of Perviz :-

Andy said to Perviz there are "400" pages documents and these "400"

pages transfer to X, Y, Z. Company Lahore,

Perviz has received "400" pages documents.

and Perviz are see these "400" pages

documents. So these documents are

written in French. Language -

M-Usama

③

ID # 14150

And The Company send This documents  
So that company are not understand

French - That company understand The  
English language. So 'Perviz' Transfer

This "400" Pages in English and Then  
Perviz handled The document to shogun-

④ Role of shogun :-

When shogun see This files  
Documents is going to 'Bannu' to Lahore

X. Y. Z company - So shogun will call

The X. Y. Z company Lahore, and shogun

Said. Your company is open He

Said Yes. Oh what time is

open. He said Banni and shogun

Said Before 8 o'clock today a documents

will arrive at your company. When you

get This 400 files Then Plz. call me.

### ⊕ Role of Tariq :-

Shujan Handled The 400 files Documents to Tariq. When Tariq received The documents - He said This file is very Important. and Then This 400 Pages are divided The Four bundles of 100 Pages and it will become 4 bundles. if one will lost The remaining 3 bundles will reached.

### ⊕ Role of NAWAZ :-

Tariq Handled The "400" Page of '4' bundle to 'NAWAZ', So NAWAZ Put The address (to, in from) on These bundle.

### ⊕ Role of Danish :-

And Then Nawaz Handled by These documents To "Danish". Danish received These four bundles of Documents. So That no one see it Document.

Ⓐ Role of Paul :-

Danish handle to Paul, and then told him, you should no go/Drive on Cr-T Road. Use The Motorway. Because you reached fast.

- ↳ The Document reach in Lahore and handled
- The document to reception department (Anjial Joya)
- ↳ The reception department has transfer These document to another department (Data Ink Layer) and see This file the fax file handled will be sealed. This mean no-one has seen This. files we will sent This files document on 3rd Department Network Layer
- so That department check The address. ok This is our company Address and sent The file into 4th Department (Teas Post Layer) That convert 4 bundle into one bundle by Then sent into 5th Department (Session Layer)
- That see This documents 4 call to "Bombla".

Company - Your file "400" page documents has been reached. The connection b/w these two company are ended by the send file or 6<sup>th</sup> Department. No the want it we will read this file are now.

~~★~~ ★

### ④ Application Layer :-

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

#### Function :-

- ⇒ Network virtual terminal -
- ⇒ File Transfer axis management.
- ⇒ email services -
- ⇒ Directory services -

### ④ Presentation Layer :-

It deal with syntax and semantics of the information exchange b/w two system.



Function :

Transaction / Encryption / Compression.

④ Session Layer == Dialog Control

Function

=> Synchronization.

④ Transport Layer == Responsible for Process delivery.

Function

=> service point addressing  
Q7 segmentation and responsible.

④ Network Layer == Responsible for source distribution 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 deal with

Bit level Transmission w/ different devices and electrical or mechanical interface, connecting to the Physical medium for Synchronized.

Q.1

Part # B

Data is independent of signal levels ....

[Ans]

Few Reasons

⊕ Noisy channel :-

For a noisy channel the Nyquist 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 band width of the channel "L" is the level of signal used to represent data & bit rate is the Bit rate per second.

According to the formula we might think a specific bandwidth we have bit rate we want by increasing the number. If signal level Although the idea not level we ~~can~~ impose a burden on the receiver. If the No. of the level in a

signal as just ~~to~~ receive must be very sophisticated to distinguish  $\frac{b}{w}$  by different level. In order avoid increasing the level of a signal reduce reliability of the system.

④ Noisy channel: Shannon capacity:-

In reality we have not a noiseless channel.

The channel is always noisy. In 1949 ~~the~~ Claude (Shannon capacity) to determine critical highest data rate for a noisy channel.

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

In this formula Bandwidth is the bandwidth of the channel. SNR is the signal to noise ratio. And capacity is the capacity of the channel per second.

Note: That is the Shannon formula.

That is no indication of the signal level.

which mean That no matter how many level we have. we cannot achieve a data rate high. Then The capacity of The channel.

Q-2 Sometimes The sender sent The information to The receiver. ....

Ans The sender sent information or some data but The receiver do not receive exact or total data due to following Reasons or Facts-

1) signal attenuation (2) signal distortion  
(3) Noise-

(1) signal attenuation :-  
To Compresente signal  
attenuation loss - amplifier are used to amplify The signal.

(2) signal distortion :-  
The minimize This loss  
effect by using error detection and  
correction schemes.

(3) Noise :-

Noise is a spike come from Power line lightning etc. using High quality medium signal like fiber-optic etc can minimize This effect.

Q3

For Transmitting huge amount of data over long distance which type of Technology we usually use?

Ans

To Transmit a huge amount of Data we use The following Technology-

(1) High Bandwidth :-

Fiber optic cable is support Atomically higher bandwidth and hence data rate by bandwidth utilization over fiber-optic cables are limited not by the medium but by the signal generation and reserfren Technology available.

(2) Less signal attenuation :-

Fiber-optic transmission distance

is a significantly greater than that of other

media. A signal can travel for 50 km

without requiring regeneration. We need repeaters

every 5 km for "coaxial or twisted pair cable

electromagnetic interference :-

(3) Immunity :-

Electromagnetic noise cannot

affect fiber-optic cables.

(4) Resistance to corrosive material.

Glass is more resistant to corrosive material than copper.

(5) Light weight :-

Fiber-optic cables are much lighter

than copper cables.

(6) Greater immunity to tapping :-

Fiber-optic cables are more immune to tapping

than copper cables. Copper cables create

antenna effect that can easily be tapped.