

Name - Bhupesh Bhatt

Rollno - 01911502818

Subject Name - DCN (Data Communication Network)

Subject Code - ETEC 310

Date - 27/04/2021

(a)

Ans 1) ISO stands for International organization of standardization. This is called a model of open system interconnection (OSI) and is commonly known as OSI model. The ISO-OSI model is seven layer architecture. It defines seven layers or level in a complete communication system.

Layer 1 - Physical Layer

It activates, maintains and deactivates physical connection. It is responsible for transmission and reception of the unstructured raw data over network.

Layer 2 - Data Link Layer

The main function of this layer is to make sure data transfer is error free from one node to another over physical layer. Transmitting and receiving data frame sequentially is managed by this layer.

Layer 3 - Network Layer

It acts as a network controller. It manages subnet traffic. It decides which route data should take.

Layer 4 - Transport Layer

It decides if data transmission should be on parallel path or single path. It does multiplexing, splitting & segmenting.

Layer - 5 Session Layer

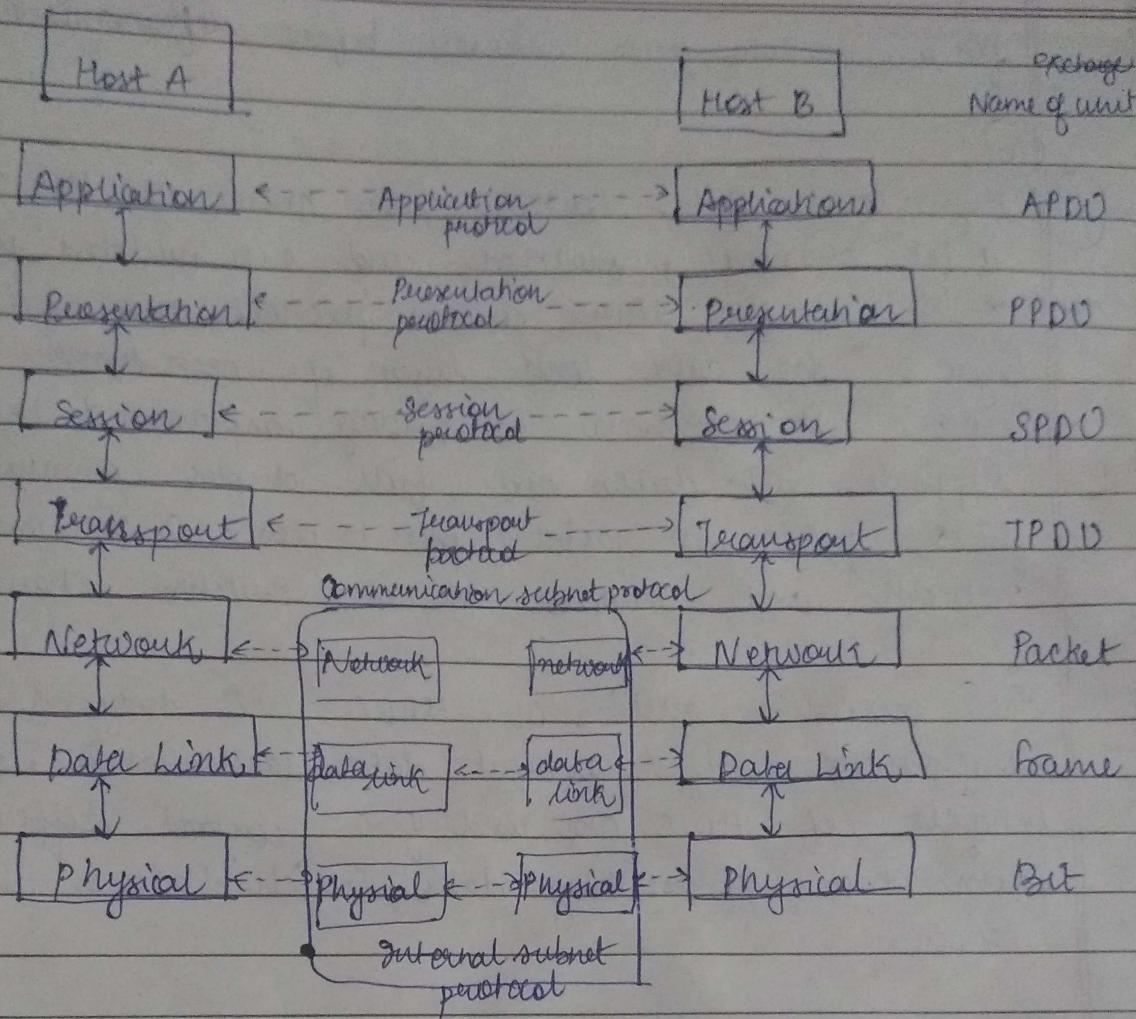
Session layer manages and synchronize the conversation between two different applications.

Layer 6 Presentation Layer

This layer takes care that data is sent in such a way that receiver will understand the information (data) and will be able to use data.

Layer 7 Application Layer

This is top most layer and transferring of files disturbing the result to the user is also done in this layer.



The OSI model

(i) (b) Carrier sense multiple access with collision detection (CSMA/CD) is a network protocol for further carrier transmission that operates in the medium access control (MAC) layer. It senses or detects whether the shared channel for transmission is busy or not and defers transmission until the channel is free. The collision detection technology detects collision by sensing transmissions from other stations. On detection of a collision, the station stops transmitting, sends a jam signal, and then waits for

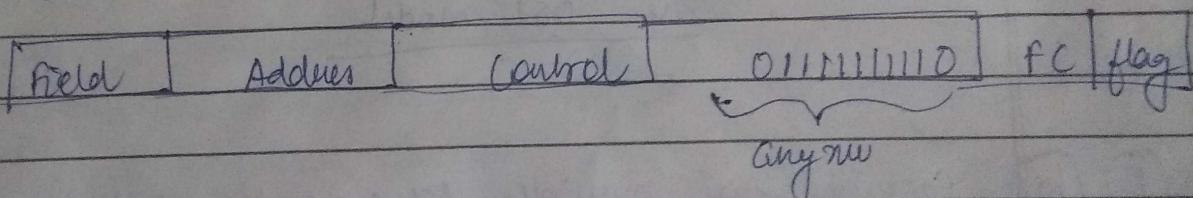
for a random time interval before retransmission.

(a)

Ans (2) Higher level Data Control, also known as HDLC, is a bit oriented, switched and non-switched protocol. It is a data link control protocol and falls within layer 2, the data link layer of open system interface (OSI) model. It has been so widely implemented because it supports half duplex and full duplex communication lines, point to point (peer to peer) and multi-point networks and switched or non-switched channels.

The procedures outlined in HDLC are designed to permit synchronous, code transparent data transmission. Other benefits of HDLC are used for control differ dramatically from those representing data, which reduces chances of error.

HDLC frame structure



Ans (2) (b)

Guided media

The signal energy propagates through wires.

It is used for point to point communication.

Discrete network topologies are formed by guided media.

Signals are in form of voltage current / photons in guided media.

By adding more wires, the transmission capacity can be increased in guided media

Unguided media

signal energy flows through air.

It is generally suited for radio broadcasting in all directions.

Continuous network topologies are formed by unguided media

signals are in form of electromagnetic waves.

It is not possible to obtain additional capacity in unguided media

Guided media is more faster. In guided media we have fibre optics and it is considered to have transmission speed of 1000 Mb/s which is highest among all media.

Guided media has lesser noise and obstacles in comparison to guided media, this causes guided media to give faster rate of data transmission than unguided media.

Ans 3 (a)

There will be no error, as remainder is 0.

$$\begin{array}{r}
 1010011 \\
 1001) 1011001111 \\
 \underline{1001} \downarrow \downarrow \\
 1000 \\
 \underline{1001} \\
 1111 \\
 \underline{1001} \\
 1101 \\
 \underline{1001} \\
 1001 \\
 \underline{1001} \\
 0000
 \end{array}$$

Hence no error.

Ans 3 (b) Stop and Wait ARQ is used in connection oriented communication. The following transitions may occur in stop and wait ARQ.

- The sender maintains timeout counter.
- When a frame is sent, the sender starts timeout counter.
- If acknowledgement of frames comes in time, the sender transmits the next frame in queue.
- If acknowledgement doesn't come in time, the sender assumes that either the frame or its acknowledgement is lost in transit. Sender retransmits the frame and starts timeout counter.
- If negative acknowledgement is received, the sender retransmits the frame. and

