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Class Test

Department of Information and Communication Technology

Class Test No: 03

Class Test Name: Physical layer and Transport layer .

Course Title: Computer Networks.

Course Code: ICT-3207

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Submission Date: 21-12-2020

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Second method

1.(a). what are the concerns of physical layer in internet model?

Ans: The network physical layer is the lowest network layer in the open system interconnections (OSI) model. The primary concern of this layer is transmission of individual bits from one node to another over a physical medium.

This physical layer may be implemented by a PHY chip. The physical layer defines the means of transmitting raw bits over a physical data link of connecting network nodes. Physical layer is the only layer of OSI network model which actually deals with the physical connectivity of two different stations.

Q. (b) How does transmission media affect a network? What is the purpose of transmission media?

Ans: The higher is the bandwidth, the more data the transmission media can handle at once.

If the lower bandwidth transmission media, the media would not be able to carry as

much data, meaning that the data would take longer to be sent.

The more delays there are, the longer

it takes to transmit data across a

network. Latency is affected by the

number of devices on the network

and the type of connection device.

The greater the number of devices

connected to a network, the more important the choice of transmission medium becomes.

Other purposes of transmission media: Transmission media is a communication channel that carries the information from the sender to the receiver. Data is transmitted

through the electromagnetic signals. The main

functionality of the transmission media

is to carry the information in the

form of bits through LAN.

It is a physical path between transmitter

and receiver in data communication.

I(c). What is the purpose of ~~of~~ multiplexing? Why do you need switching in data communication?

ANS: The purpose of multiplexing is to enable more signals to be transmitted over a given communication channel, thereby increasing transmission efficiency.

The other purpose of multiplexing is that we can transmit a large number of signals to a single medium. It is also used to communicate by means of a medium with combination of multiple signals.

needed switching in data communication:

In large networks, there can be multiple paths from sender to receiver.

The switching techniques will decide the best route for data transmission.

Switching technique is used to connect systems for making one-to-one

communication. Besides switching is also used to

connect multiple devices on the same network within a building or campus.

As a result, we can easily transmit

the data to each connected device.

This reduces the requirement of extra wires, resulting in less cost of connection.

2.(a). How is a digital signal transmitted? Why is digital transmission preferred over analog?

Ans: A digital signal can be transmitted over a dedicated connection between two or more users. In order to transmit analog data, it must first be converted into a digital form. This process is called sampling or encoding. Sampling involves two steps:

i. Take measurements at regular intervals.

ii. Convert the value of the measurement into binary code.

Digital transmission is preferred over analog because of effect of distortion, noise and interference is much less in digital signal.

2(b) What is the process of converting digital data into digital signal? Why

digital data not easily affected by noise?

Ans: The process for converting digital data into digital signal said to be Line coding. Digital data is found in binary

format. It is represented or stored internally as series of 1s and 0s.

Digital Signal is denoted by discrete signal which represents digital data.

Three types of line coding schemes:

- Uni-polar encoding
- Polar encoding
- Bipolar encoding

uni-polar encoding: unipolar encodes use single voltage level to represent data. In this case, to represent

binary high voltage is transmitted and to represent no voltage is transmitted.

polar Encoding: polar encoding schema uses multiple voltage levels to represent binary values.

Bipolar Encoding: Bipolar encoding uses three voltage levels, positive, negative and zero.

zero voltage represents binary 0 and bit 1 is represented by altering positive and negative voltages.

Digital data not easily affected by noise:

Noise is inevitable in the signal transmission

-ission. In a digital transmission the amplitude of the noise must be higher

than both the amplitude of the signal at

Binarbytus rotinii which is generally not the

case - root and its vice versa.

2(c). why is quantization required in
data flow

Digital transmission? when data can be transmitted in both directions?

Ans: Quantization is required to reduce the computation demand and increase power efficiency. Quantization is an umbrella term for different

efficiency. A function that covers a lot of different terms that convert input values from a set of techniques to convert input values from a set of techniques.

large set to output values in a

smaller set. for illustration in section

noise increment

listings

data flow in both direction: full

to be duplex can flow data in both direction.

In a duplex type of topology one

communication, data or information can

be transferred in both direction.

Ques: What is the role of carrier signal

Q) In digital transmission which chip is used in analog to digital?

Ans: In analog transmission, the sending device produces a high-frequency signal that acts as a base for the information signal. This base signal is called the carrier signal.

Carrier signals are at carrier frequency.

The receiving device is turned to the

frequency of carrier signal that it expects from the sender.

A/D converter is used in analog to digital.

An A/D converter is used to convert an analog signal like voltage to digital form so that it can be read.

and processed by a microcontroller.

Some microcontrollers have built-in A/D converters.

Ques 3(b). Why do you need digital to analog conversion? e.g. wifi analog or digital?

Ans: Digital to analog conversion is a process of which digital signals having a few defined levels or states are converted into analog signals having a very large number of states. Both

the digital to analog and Analog to digital conversion areas of significance exist in many applications of digital

Signal processing

wifi is Analog or digital: wifi can be analog

and digital. Analog part of the wifi

is the electromagnetic waves used to

carry the data. Meanwhile the digital

part is the analog to digital converter to

need analog to digital converter to

receive the data and vice versa,

digital to analog to transmit.

As a result, wifi will be both

analog and digital.

This makes it suitable for

multiple users at once.

3(c). what is wired transmission media?

what is the difference between coaxial cable and twisted pair cable?

Ans: Guided media is a wired

transmission media, in which data

signals are guided along a physical

path within a wire. Guided

transmission media is also known as

bounded or wired. Some well-known

guided transmission media includes

twisted cables, coaxial cable, fiber optic

cable etc.

Difference between coaxial cable and
twisted pair cable:

Coaxial cable	Twisted pair cable
<p>Coaxial cables are difficult to install and expensive.</p> <p>Twisted pair cables are easy to install and cheap.</p>	<p>Coaxial cables are difficult to implement.</p> <p>Twisted pair cables are easy to implement.</p>
<p>Transmission of signals happens via inner conductor of coaxial cable.</p>	<p>Transmission of signals happens via metallic conducting wire.</p>
<p>coaxial cable supports a bandwidth of moderate range.</p>	<p>Twisted pair cable supports a bandwidth of low range.</p>
<p>Application of coaxial cable are in internet connections, television signal distribution and radio transmission etc.</p>	<p>Application of twisted pair cable are in telephone networks and cable shielding.</p>

<u>Coaxial Cable</u>	<u>Twisted pair cable.</u>
<p>Coaxial cable has finest protection compared to twisted pair cable, there is lower noise immunity.</p> <p>cost of coaxial cable is comparatively expensive.</p>	<p>cost of twisted pair cable is less compared to coaxial cable.</p>
<p>Advantages</p> <ul style="list-style-type: none"> wide bandwidth less loss less interference 	<p>disadvantages</p> <ul style="list-style-type: none"> high cost lower noise immunity

4.(a). How does wireless transmission work?

Ans: The transmission of data wirelessly is made possible by the manipulation of radio waves. These waves are generated naturally by generating pulses of electricity. These radio waves can then be modified by their amplitude or frequency in order to transmit sound or data.

Wireless local area networks use a high frequency radio technology similar to digital cellular and a low-frequency radio

technology spectrum between multiple devices in a limited area.

Q(5). How does a radio signal created? How do radio waves go through

walls? to noise, reflection, diffraction

to noise, absorption

Ans: A radio wave is generated by

a transmitter and then detected by

a receiver. An antenna allows

radio transmitter to send energy into

space and a receiver to pick up

energy from space. Transmitter and

receiver are typically designed to operate

over a limited range of frequencies.

A radio transmitter is an electronic circuit

which transforms electric power from a

power source (battery or mains)

power, into a radio frequency

alternating current to it apply to the apply
 increases not but the antenna radiates the
 antenna, and the antenna radiates the
 energy from this current as radio
 waves.

Not less fibres are devoured by waves.
 Radio waves go through walls. Radio waves
 are much bigger than light waves.
 Radio waves are bigger than the size of
 atoms in a wall that is why they
 go through, while light is a small wave
 and cannot get through the wall if the
 wall is made out of glass, light will go
 through it. If the wall is made
 out of iron, the radio waves will not

goes through the wall.

Ques. Why microwave is used for communication? What are the limitation of microwave transmission?

Ans: Microwaves are widely used for

point to point communications because their

small wavelength allows conveniently sized

antennas to direct them in narrow

beams, which can be pointed directly at the receiving antenna.

Microwave supports larger bandwidths and hence more information is transmitted.

Higher data rates are transmitted as the bandwidth is more.

Low power consumption of higher frequencies, as the signals are more to the

Microwaves are easily attenuated within shorter distances. state level, satellite

+ and terrestrial communications with high capacities are possible.

Limitation of Microwave transmission:

- cost of equipment more installation

- cost isn't high.

- They are thefty and occupy more space.

- Electromagnetic interference may occur.

- Variations in dielectric properties with temperatures may occur.

- Inherent inefficiency of electric power.

- Propagation losses.

5. (a). What happens to the light when it still is transmitted?

Ans: When light hits an object, it is transmitted, absorbed and reflected.

The light on the left is reflected,

The light in the middle is absorbed

and the light on the right is

transmitted. Any object you can see

must at least partially reflect

light to your eyes. Objects can also

absorb or transmit light.

→ when light travels through a medium

such as glass without being reflected

absorbed or scattered. When this happens

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light energy is not lost and can be considered 100% transmitted.

What is the difference between Frequency Division Multiplexing and Time Division Multiplexing?

Ans: FDM is one channel division while TDM is multiple channels division.

Frequency division multiplexing Time division multiplexing

Multiplexing technique is analog	Multiplexing technique is digital
Not needed to synchronization. circuit orientation is complex.	Necessary to synchronization. circuit orientation is comparatively simple.
Cross talk exists	Cross talk does not exist.

frequency division multiplexing	Time division multiplexing
The available channel is used effectively.	The available channel is used ineffectively.
interference of signal are low and negligible.	interference of signal is quite high.
Time sharing takes no place. Frequency sharing takes place.	Time sharing takes place.
Optical fibre cable or copper fibre cable applies frequency division multiplexing.	Telephone companies and internet service providers applies time division multiplexing.

5(c). what layer does a switching circuit take place? as managed switch or a router?

Ans: switching takes place at the physical layer.

Before starting communication, stations make a reservation

the stations must reserve time slots for the resources to be used during

communication.

multiple stations share bus: normally, a router manages switch a router:

only has 4 LAN ports and one WAN port, while switches have much more ports such as 12, 24, 48 etc.

Routers are used to connect two or more networks, while managed switches

are used to connect two or more nodes in the same network.

6(a). What is the role of transport layer?

Ans: Transport Layer provides transparent link to support transfer of data between end users, providing reliable data transfer services to the upper layers. The transport layer controls the reliability of a given link through flow control, segmentation and desegmentation and error control.

Transport layer meeting the reliability requirements of applications, if any.

Multiplexing multiple communication streams from many users or applications on the same network.

Switches or routers of new ones.

Identifying the applications and services on the client and server that should handle transmitted data.

Maintain state progress
segmenting data at the source and reassembling the data at the destination.

Establish individual communication streams between applications on the source and destination hosts.

Identifying the proper application for each communication stream through the use of port numbers. It also provides other services such as reliable data transfer, bandwidth guaranteed and delay guarantees.

Q(b): what are the design purposes of transport layer? which devices use transport layer?

Ans: Accepting data from session layer, split it into segments and send to the network layer. Ensure correct delivery of data with efficiency. Isolate upper layers from the technological changes. Before control and flow control.

Devices used of transport layer: The devices used of transport layer that typically operate are network devices or gateways. The transport layer of the TCP/IP model corresponds to the transport layer of the OSI model.

Ques.

Does not provide reliable end to end communication? what is used to set up end to end communication that takes place between hosts?

Ans: TCP, not UDP provides reliable end

to end communication. Error Recovery

means of detecting code and by

automatic repeatable request protocol.

Set up the connection to end communication:

TCP is connection oriented. It establishes a

logical end to end connection between the

two communicating hosts. Control information,

No two hosts communicating without exchanged between

called a handshake to establish a dialogue

between the two endpoints

before data is transmitted.

Ques. what is Transmission control protocol used for?

Ans: The transmission control protocol is a transport protocol that is used on top of IP to ensure reliable transmission of packets. TCP includes mechanisms to solve many of the problems that arise from packet-based messaging, such as lost packets, out-of-order packets, and corrupted packets. Because the protocol ensures a two-way communication and all data arrives fully transmitted and can be assembled by the receiver in the correct order.

Q6: How a TCP/IP connection is established?

why do you need TCP connection management?

Ans: To establish a connection, TCP uses a three way handshake. Before a client attempts to connect with a server, the server must first bind to and listen at a port to open it up; for connection.

This is called a passive open connection.

Time limit of TCP connection management: TCP is a connection-oriented protocol. Before

a connection can send data to the other, either end must be established between

a connection and repairs essentially

TCP detects and transfers problems that may affect the data transfer, such as now work

be introduced by packet loss, duplication or errors at the IP layer.

Ques. How TCP terminates a connection? which protocol has flow control and error control?

Ans. TCP allows before transmission of information in both directions. This means that computer systems that communicate over TCP can send and receive data at the same time, similar to a telephone conversation.

The connection termination phase uses a four way handshake, with each side of

the connection terminating independently.

When an endpoint wishes to stop its half

of the connection, it transmit a FIN

packet, which the other end acknowledges with an ACK.

resulted in a loss of flow control.

flow control and error control.

Data link layer is responsible for implementation of point flow and error control mechanism.

Flow control is meant only for the transmission of data from sender to receiver.

Error control is meant for the transmission of error free data from sender to receiver.

Receivers loss of medium

Ques: which of the following is important for TCP

Ans: Reliability? Review figures no marks

No firmness ti, no loss

Ans: Keep-Alive timer is important for TCP
Reliability. A keep-alive timer is used to prevent a long idle connection between

two TCPS. If a client opens a TCP

connection to a server and transfers some data and becomes silent the client

will crash.

In this case, the connection remains open forever so a keep-alive timer is used. This timer provides a mechanism to identify dead connections.

Q8(b) What are the functions of User Datagram protocol (UDP)? Where is UDP used?

Ans: User Datagram protocol is a communication protocol that is primarily used for establishing connections between applications on the internet. It tolerates connections over the Internet. It enables the receiving party to receive data before the sending end has transferred all of it. An agreement is provided by the receiving party.

When IP delivers a UDP datagram to the host, it checks the port number and delivers the data to the corresponding application. In this way, UDP provides simple multicasting.

-plexing to overcome IP's limitation of allowing a host to send and receive data on multiple distinct ports.

using of UDP. UDP is commonly

used for applications that

(can't handle some packet loss) such as

streaming audio and video. It is also

used for query-response applications, such as DNS queries.

Numerous regular internet applications use

UDP, because UDP datagram are used

for sending bits of data known as packets over the internet.

Ques. How does UDP establish a connection?

write down the application of UDP?

Segment Transport layer base

Ans. To transmit a UDP datagram, a computer completes the appropriate fields in the UDP header and forwards the data together with the header for transmission to the IP network layer.

by definition UDP is a transport layer protocol defined for use with the IP network layer communication consequently does not incur connection establishment and

not incur connection establishment and therefore there is a minimal overhead associated with the system state.

Application of UDP:

- used for simple request response communication when dimension size of data is less and hence there is lesser concern about flow and error control.
- It is suitable protocol for multicasting as UDP supports packet switching.
- UDP is used for some routing update protocols like Routing Information Protocol (RIP).
- Normally used for real time applications which can not tolerate uneven delays between sections of a received message.

- UDP takes datagram from network layer, attach its headers and send it to user, so, it works fast.
- Application layer can do some of the tasks through UDP -
 - Trace Route
 - Recorded Route
 - Time Stamp
- Following implementations uses UDP as a transport layer protocol:
 - NTP
 - DNS
 - BOOTP, DHCP .
 - NNTP
 - quote of the day protocol