# Asfand yar safdar…

# 12982

# Transmission switching and signaling

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# Question no 1

# Design a multistage (3stage) for N=200, n=20 & k=10 using

# Ans…

In the first stage we have N1n or 10 cross bars. Each of size 20×10 In the second stage we have 4 cross bar each of size 10×10 In third stage 10 cross bar each of size 4×20 the total number of cross point is 2KN +k(N/n)² or cross point. This is 5 percent of the number of cross point in a single stage switch (200×200) = 40,000)

According to the close criterion:

n= (N/2)½

k˃2n -1

Cross point ≥ 4N ([2N) ½-1)

# Question no 2

# What is access network? Give examples of some of the technologies used in access network?

# Ans…

Access network is a user network that connects subscribers to particular service providers and, through the carrier network, to other network such as the internet

# Examples of access network…

Access network are ISP home network, enterprise networks ADSL, mobile network, FITH etc. It is the most commonly installed wired LAN technology and it provides services on the Physical and Data link Layer of OSI reference model. Ethernet LAN typically uses coaxial cable or twisted pair wires.

* **Eithe**r is the most commonly installed wired LAN (local area network) technology.
* **Wireless LANs** allow mobile users to connect through a wireless (radio) connection
* **Fiber optic** network such a fiber to home (FTTH) use **optical fiber** from a central points directly to individual buildings such residences, apartment buildings and businesses.
* **ADSL (Asymmetric digital subscriber line)** is a technology for high bandwidth on existing phone lines of homes and businesses

# Question no 3

# What is digital telephony? With an example explain the digitization of the PSTN.

# Ans…

Digital telephony is use of digital electronics in the operation and provisioning of telephony system and services since the last 20th century, a digital cross network has replaced the traditional analog transmission and a signaling system, and much of the access network has also been digitized.

Voice over internet protocol is another form of digital telephony that has become very popular. With VoIP technology, you make digital voice and video calls via the internet .An example of a VoIP service is Skype the receiver may get the call on his own computer, on a fixed phone line or on a cell phone

# PSTN…

The public switch telephones network (PSTN) is a mesh network of lines, trunks, switches Etc. that connect customer provided Equipment (CPE) Together the CPE to communication together the PSTN was originally designed to optimize the transmission of voice services

# Question no 4

# What is PDH? Name some of its limitation and advantages of SDH/SONET. Show the path section designation of SDH. Also show SDH frame and calculate its basic capacity for a byte and frame.

# Ans …

# PDH…(Plesiochronous digital hierarchy)

The plesiochronousdigital hierarchy (PDH) is a telecommunication network transmission technology designed for the transport network of large data volumes across large scale digital network.

The PDH design allows the streaming if data without having isochronous (clock running at identical times, perfectly synchronized) to synchronize the signal exchange. PDH clock

# Advantages of SDH…

* Synchronous network and SDH support multipoint networking
* Capability of transporting existing PDH signals
* Easy growth to higher bit rates which enhance the administration and maintenance process
* It is capable transporting broadband signals

# Question no 7

1. A microwave transmitter has an output of 500 mW. What is its output in dBW?
2. A combining network is two input; +20 dBm and +6dBm. It has an insertion loss of 3 dB

What is combined output in dBm?

# Ans …(a)

A microwave transmitter has an output of 500 mw what is its output

500mw =dBw?

500mw= 16.66?w

16.66/w = -4.99.8dbw

# (B)

A combining network has two input +29dBw and +6dBm it has insertion lost of 3Db what is combined output in Dbw?

Output in dBw

P(mw) = 1mw .10 P (dbm )10)

P(mw) =1mw.10 (+29)(+6)

P (mw) = 0.1mw +290 = +6

P(m) =290. 1dBm-60

=76.7dBm ans

# Question no 8

# VOIP. Explain w.r.t basic function, VOIP components Also explain how to overcome the challenges. What is the role of FXC and FXO in VOIP?

# Ans…

Voice over internet protocol, also called IP telephony is a method and group of technologies for the delivery of voice communications and multimedia sessions over internet protocol networks such as the internet

# The four most important VOIP components are

* Signaling gateway controller
* Media gateway
* Media server
* application server

# FXO (foreign exchange office)

Is the port that receives the analog line. It is the plug on the phone on fax machine or the plug (s) on your analog phone system. It delivers an on hook/hook-off indication (loop closure). Since the FXO port is attached toa devices ,such as a fax ora phone ,the device is often called the FXO device ‘’ this port established the connection to the analog line (FXS)

# Question no 10

# What is PSTN? How does PSTN work? Describe present day PSTN terminals, services?

# Ans …

Many people view voice services, And the PSTN used to delivery those services , As’’ old ho-him topic

# Private branch exchange (PBX)

A Private branch exchange (PBX) is a telephone system within an enterprise that switches calls between user on local line while enabling all users top share a certain number of external phone lines.

# Question no 14

# ADSL? Describe and show the modulation technique used in DSL also show and calculate and upstream and downstream data rate for ADSL.

# Ans…

# ADSL..(Asymmetric Digital subscriber line)

Also see fast guide to DSL .ADSL (asymmetric digital subscriber line ) is a technique for transmitting digital information at a high bandwidth on existing phone lines to homes and businesses

# Modulation techniques

In ADSL there are two competing modulation schemes.

1. Carrier less amplitude phase(CAP)
2. Discrete multi tone(DMT)

# Question no 15

# Explain the multiplexing hierarchy T3?

# Ans …

In telecommunication, a digital multiplexing hierarchy is a hierarchy consisting of an ordered repetition tandem digital multiplexer that produce signals of successively higher data rates at each level of the hierarchy

T3 line carriers 672 channels that each run at 64 kbps a multiplexer is a similar to a digital switch that accept the individual channel and has a singular output the digital signal are multiplexed over different time slots enabling several channels to be carried on the same data line.

# Question no 16

# Explain SIGTRAN?

# Ans…

SIGTRAN stack is the protocol stack that support transmission of switched circuit network (SCN) signaling via ip network it also uses the standard IP transport protocol as the transmission bottom layer and satisfies the special transmission requirement of SCN signaling via adding its own functions.

# Question no 17

# Explain SS7oip?

# Ans…

An SS7 over IP network consists of a traditional SS7 network that can integrate IP-enabled or all I-P deices with protocol defined by the internet engineering task force (IETS) standard organization SS7 –over –IP signaling primarily addresses the transport aspect of SS7 . call –control services and other type of deployed without concern for the method of interconnection. The method of services implementation however, remains dependent on the particular network element chosen to support the services rather than the transport chosen. The section looks at the limitation of the SS7 network and its network components role of SIGTRAN protocols, the purpose of SS7over –IP networks the advantages of transitioning to this network , and when it is time to consider transitioning \

# Question no 18

# Explain SCTP?

# Ans…

Transport layer is responsible for process to process delivery. The delivery of packet, part of a massage from one process to another. Two process communication in a client /server relationship

# SCTP…

* SCTP is a massage –oriented , reliable protocol (RFC 29 60)
* One top of a connection less packet network
* Perform better in the presence of losses; no strictly ordered delivery
* Designed for new internet application ; ISDN over IP (IUA) , SS7 signaling

# Question no 19

# Explain IP Telephony?

# Ans …

# Different type of IP Telephony…

* PC to PC
* Phone to phone over IP
* PC to Phone
* Phone to PC

# Different type of IP standard

* H .323 standard
* Session intuition protocol (SIP)
* Media gate way to media controller protocol (MGCP)

# Question no 21

# What is parity, even parity and odd parity?

# Ans ...

Parity is a mathematical term that defines a value as even or odd. For example the number of 4 has an even parity while the number 5 has an odd parity … if two even or odd value are compared with each other , they have the same parity in computer science parity is often used for error checking

# Even /odd parity (1)

* Computer can sometime make errors when they transmit data.
* Even /odd parity

Is basic method for detecting if an odd number of bit has been switched by accident

* Odd parity:

The number of 1 bit must add up to an odd number

* Even parity

The number of 1 bit must add up to an even number

# Even/odd parity (3)

* It is useful when an odd number of 1 bit is flipped
* Suppose we have an 7 bit binary word (7-digits)
* You now have 8 digit word
* However, the computer knows that the added bit is a parity bit and therefore ignore it

# Even/odd parity (2)

* The computer knows which parity it is using
* If it uses an even parity
* If the number of 1 bit add up to an odd number then it knows there was an error.
* If it is uses an odd
* If the number of 1 bit add up to an even number then it knows there was an error:

# Example (1)

* Suppose you receive a binary bit word “0101” and you know you are using an odd parity
* Is the binary word errored?
* The answer is yes
* There are 2 1 bit which is an even number
* We are using an odd parity
* So there must have an error.

# Question no 22

# Explain FTTx (FTTH, FTTC, FTTB, FTTCab etc).

# Ans…

FTTX refers to all type of fiber infrastructure including fiber to the home FTTH fiber to the premises FTTP fiber to the club node FTTN

FTTH stands for fiber to the home and is synonymous with FTTP fiber to the premises they both refer to a fiber optics cable running directly from the internet services provider (ISP) to a home or business location

FTTC stand for fiber to the curb and refers to fiber optics cable run to the curb near the user with a copper Ethernet cable connecting the fiber at the curb