ASSIGNMENT

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SECTION-A

1) What are links & What are types of link?

→ Link establish Connection b/w 2 network and allow flow of data.

Types :- Simplex
Half Duplex
Full Duplex.

2) What is PING and IPCONFIG?

→ PING :- Is taken from sonar operations to locate objects.

IPCONFIG :- Its used to display tcplip. Information on host.

3) Expand HTTP: Where is it used:

→ HTTP :- Hypertext Transfer protocol
Its used in web browsers & web servers.

4) What is a switch?

→ Switch is device in Computer network that Connects other device together
• Multiple data & Cables are plugged in switch for Communication.

5) What is Nyquist signalling rate for noiseless Channel?

→ Its given by formula,

Bitrate = 2 * Bandwidth * $\log_2 L$.

6) What is the diffrence b/w UTP & STP cables?

→ UTP :- • Cheaper than STP
• Grounding not required

STP :- • Costliest than UTP
• Grounding required.

7) Define Encoding & decoding.

→ Encoding :- process of putting a sequence character into format for efficient transmission

Decoding :- Conversion of Encoded format back into original character.

8) What is pipelining?

→ Process of sending multiple data packets serially without waiting for previous acknowledgment.

9) What is CSMA/CD & CSMA/CA ?

→ • CSMA/CD :- It used to improve CSMA performance by termination transmission as soon as collision is detected.

• CSMA/CA :- Avoids collisions by listening for transmission signal before sending data.

10) What are essential Components of LAN ?

→ • Actual Computers
• Network Interface
• Switches Router. hubs.

11) Define gateway.

→ Gateway is piece of networking hardware or software used in telecommunications networks for dataflow.

12) Write any 2 goals of routing algorithm ?

→ i) correctness
ii) Its simple.

SECTION - B

13) Explain types of transmission modes.

→ i) Single duplex :-

Communication happens only in 1 direction

ii) Half duplex :-

Communication happens only in both direction but not simultaneously.

iii) Full duplex :-

Communication happens in both direction simultaneously.

14) Difference b/w Analog & Digital Transmission

Digital	Analog
→ Discrete signals	→ Continues signal
→ Records information as it is.	→ Converts information into binary
→ used in Electronic devices	→ used in analog signals
→ Voltage Value is discontinous	→ Voltage Value is Continous
→ Eg:- Electronic, computer signals	→ Eg:- Any natural Bound, human Voice.

15) Explain frequency division multiplexing

→ • FDM is an analog technique
• Bandwidth should be greater than combined bandwidth of signals to be transmitted
• Reducing numbers of wires decreases number of Cost
• FDM is used to allow multiple users to share a Physical Communication Channel.
• FDMA is traditional way of separating radio signals from different transmitter.

16) Write a note on sliding window ?

→ • Sliding window is technique for controlling transmitted data packets b/w 2 network Computers.
• Its also known as windowing
• It has 2 types :-

i) Sender sliding window :- At any instant, sender is Permitted to send frames with sequence number in Certain range.

ii) Receiver sliding window :-
• Receiver always maintain window size 1.
• It looks for specific frame to arrive in specific order.

17) Explain datagram and Virtual circuits.

→ • Virtual Circuit

- Host to host address is needed to link setup
- Messages passed in order to network.
- Connection setup is initially required prior to sending data.

• Datagram

- Host to host address always send datagram
- Connection setup not required
- Ex :- Internet protocol of TCP.

18) Describe FDDI.

→ • Fiber distributed Data Interface

- FDDI is standard for data transmission in a LAN.
- It can be extended upto range of 200km.
- It offers higher bandwidth.
- It is used for token passing & the fault tolerant features.

19) Write a note on following device.

i) Bridge :-

- Device that filter data traffic
- It divides data into segments & reduce traffic

2 types :- a) LAN Bridge
b) Transparent Bridge

ii) Router :-

- Electronic devices that join multiple Computer networks together either wired or wireless.
- Its Commonly used in house networks to share single Internet Connection b/w multiple Computers.

20) What is modem & Explain its types &

→ Modems is hardware Component that allows a Computer or another device to Connect to Internet.

Types :-

1) Internal Modem

- These are attached to Internal slot of motherboard.
- used for fax & Internet Communications.

2) External Modem :-

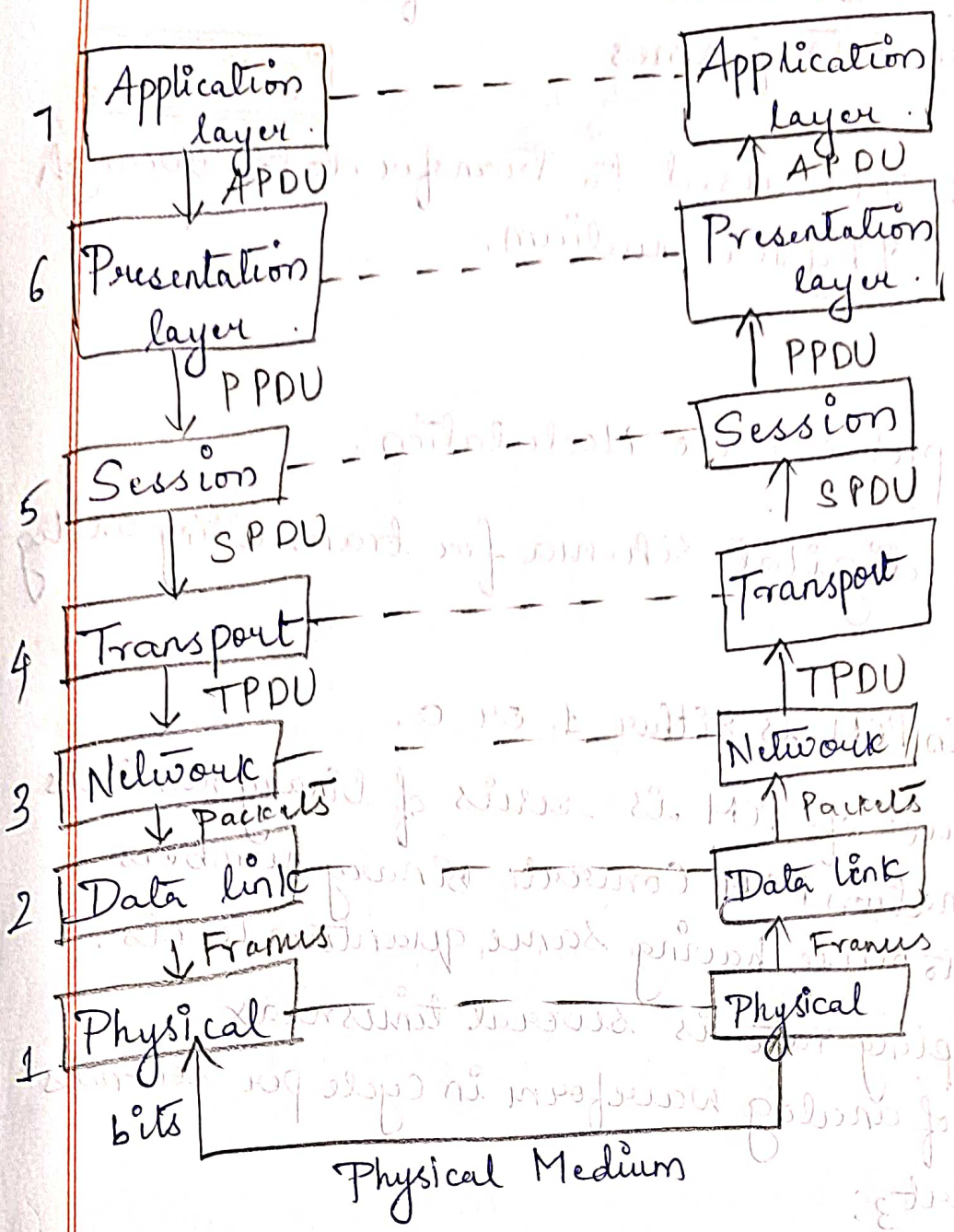
- Small box connected to a communication port of Computer.
- Its placed outside CPU box.

3) USB Modem :-

- Connected to Computer using USB port.
- It looks like USB flash drive. Even smaller than that.

SECTION - C

21) a) Explain OSI reference Model with a neat diagram.



1) Application layer :- It provides service to users
2) Presentation layer :- Its used for translation, Compression, Encryption
3) Session :- Its used to create, Manage & terminate session
4) Transport :- Its used to transfer message b/w Connected devices.
5) Network :- Its used to transfer packet b/w Connect devices

6) Data link :- It's used to transfer error free data frames.

7) Physical :- Its used to transfer data through physical medium.

b) Explain pulse code Modulation.

→ • PCM is digital schema for transmitting analog data.

- Signal in PCM is either 1 or 0.
- The output of PCM is series of binary numbers
- At destination PCM Convert binary numbers back into pulse having same quantum levels.
- The sampling rate is several times max frequency of analog waveform in cycle per seconds of Hertz.

22) a) Explain SONET Multiplexing.

→ • SONET is a standarized digital Communication Protocol.

- Data is multiplexed by separting Cables into separate channels.
- Speed of data transmission is Comparable to Gigabit Ethernet Speeds.

There are 4 Sonnet layers.

→ photonic
→ Section
→ Line layer
→ Path layer

- Its Compatible with legacy & future network.
- Very high efficiency.
- DeMultiplexing is Easy.

b) What is Hanning code & calculate sender side Hanning code of data 1110101

→ Hanning Code is an error-correction code that can be used to detect & correction errors that can occur when computer data is moved or stored.

Ex:- data 1110101.

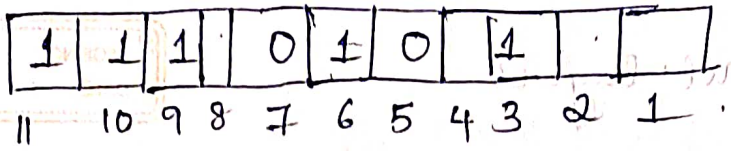
1. Number of data is 7, r is Calculated as

$2^r \geq m + r + 1$

$2^4 \geq 7 + 4 + 1$

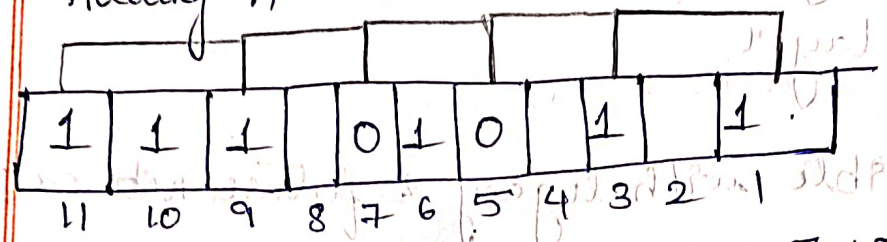
∴ No of redundancy bits = 4

2. Determine position of various bits.



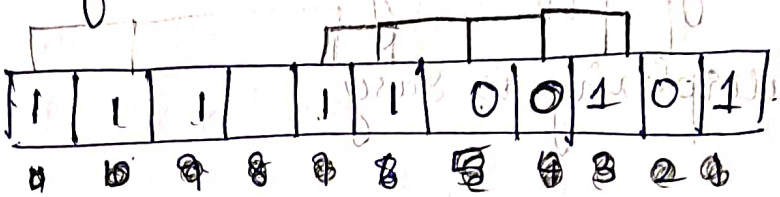
3. Determine Values of $r-1$, $r-2$, $r-4$ & $r-8$

Adding $r1$



r_2 is VRC for bit 2, 3, 6, 7, 10, 17.

Adding $r2$



~~r_4 is VRC bit 4, 5, 6, 7~~

r_3 is VRC for bit 8, 9, 10, 11.

Thus data 1 1 1 1 1 1 0 0 1 0 1.

23) a) Explain Stop & wait ARQ in detail.

→ • Its method in telecommunications to send information b/w connected devices.
• It has time out timer.
• Its used in Connection-oriented Communication.

- If offers errors & flow control.
- It is used in DataLink & transport layer.
- It is mainly used in sliding window protocol.
- It sends one data packet at time.
- Receiver sends acknowledgment after receiving each packet.

b) Explain optical fibre.

- optical fibre is flexible, transperent fibre made by drawing glass or plastic.
- It is used in fibre-optics communication.
- It provides higher bandwidth that means faster speed.
- It has stranger security
- Has greater flexibility.

c) Define TELNET.

→ A Network protocol that allows a user on one Computer to log into another Computer that has same Network.

25) a) What is leaky bucket algorithm.

→ • Its based on a analogy of how a bucket with constant leak will overflow if either average rate at which water is poured in exceeds the rate at which bucket leaks or if more water than capacity of bucket is poured all at once

• Its used in packet-switched computer network

• Its taken Independent.

• Its used to implement traffic policing.

• Packets are destroyed instead of tokens.

b) What is Bellman ford Algorithm.

→ • Algorithm that computes shortest paths from single source vertex of all other weighted graph.

• It can detect & report negative cycle.

• Its capable to handle negative weights

• Its Complex

• Its slower Compared to Dijkstra algorithm.

SECTION - D

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26) What is Topology & Explain different types of topology.

→ Topology defines structure of N/W of how all components of N/W are connected to Each other.

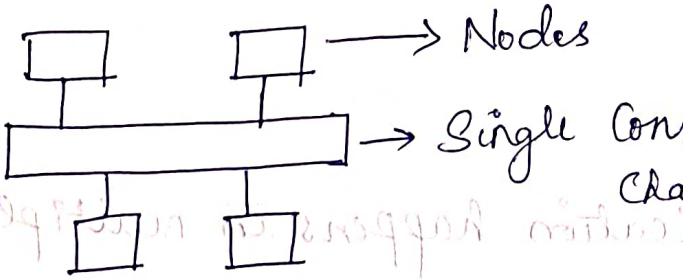
Types :-

1) Bus :-

All workstation is connected to single communication channel.

Advantages :- Data can be sent simultaneously.

Disadvantage :- • No security
• More duplications

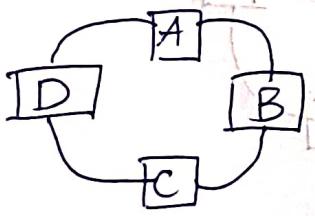


2) Ring :-

Data passes in single direction. i.e., clockwise

Advantages :- There is no duplication.

Disadvantages :- No much security.



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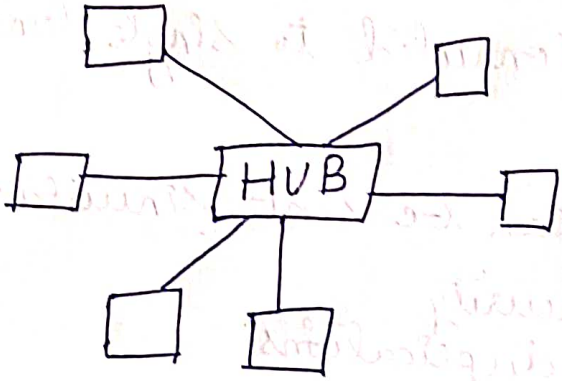
3) Star :-

Communication happens directly from hub.

Advantages :-

- High security
- No duplications.

Disadvantage :- If Hub goes down, Entire network fails.

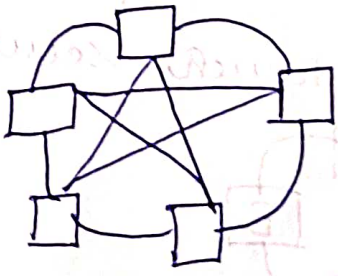


4) Mesh :-

Communication happens in multiple directions.

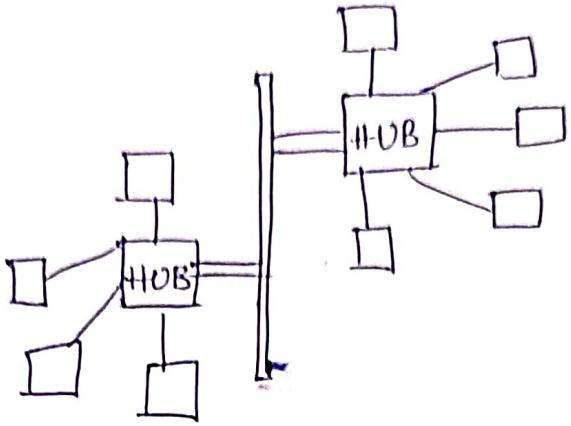
Advantages :- There is more than one Communication

Disadvantage :-
- Complex
- costly.



5) Tree :-

- Combination of bus & star topology.
- Single Communication Channel is connected to hub.



6) Hybrid.

- Its used to connect any combination of N/W topology to give desired connections.