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Ans. to the q.no-1 (a)

For n device in network, number of cables required for different topologies

Mesh: $\frac{n(n-1)}{2}$ no links

Ring: $(n-1)$ no links

Bus: If bus is a device then $(n-1)$ or else n no of links ~~with a backbone~~.

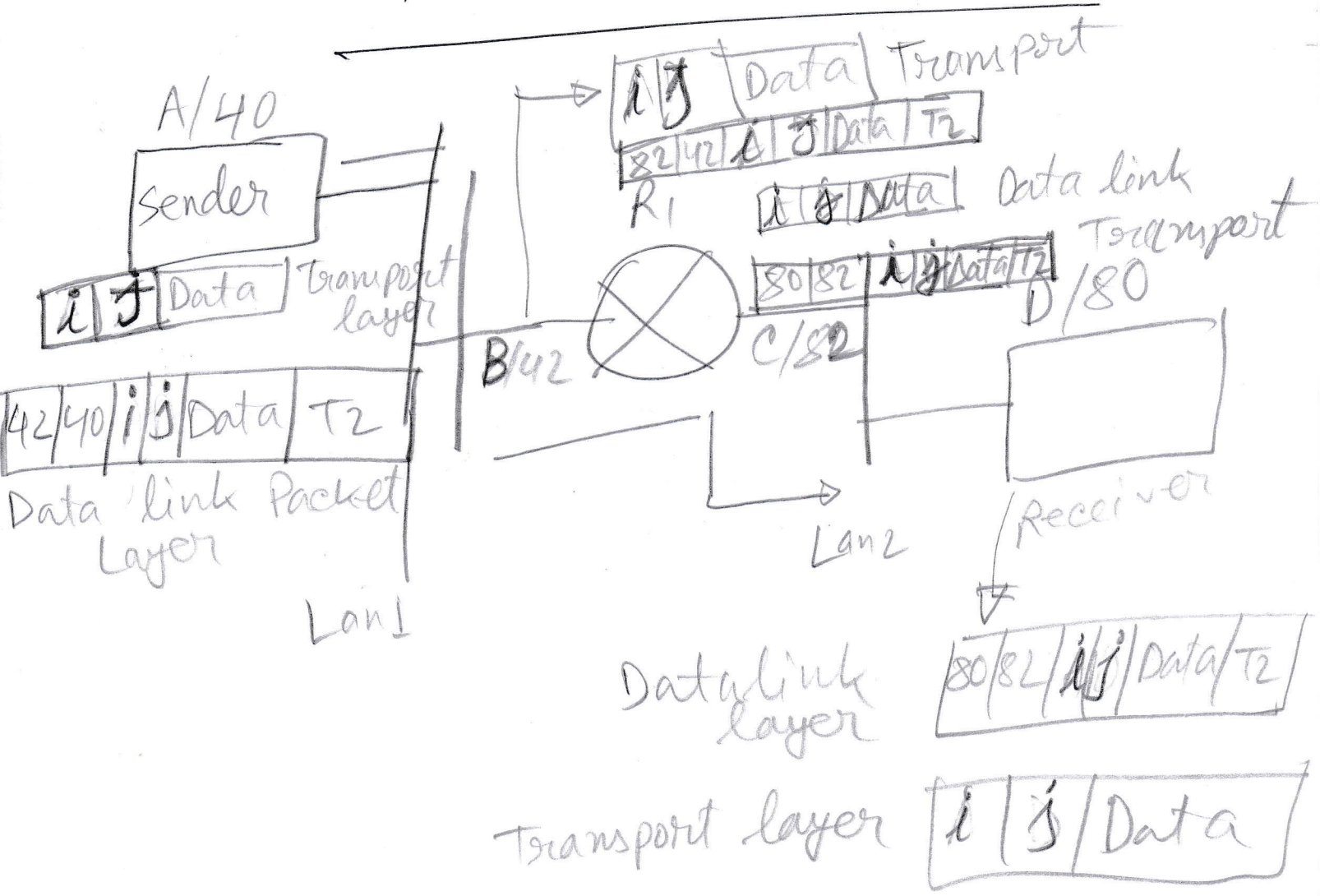
Star: n no links.

Ans. to the q.no-1 (b)

(a) In a mesh topology network every device is connected to other device. So, if a connection fails all other connections will be working. Only the failed connections will not (2 device) exchange data. May communicate through other lines.

(b) In a star topology all devices are connected to a central hub. So if one connection fails between a hub and a device, then only one device will be disconnected. [Only hub failure can cause all devices to be disconnected]

Ans. to the q. no 1 (e)



Ans. to the q. no - 2(a)

Layers.	Services.
Physical.	Physical topology, ---- , data rate, Synchronization of bits, representation of bits.
Application	File management, ---- , mail service, ..
Session	Dialog control, ---- ; synchronization.
Network	Logical addressing, ---- , packet.
Presentation	Translation, encryption, compression.
Transport	Service port addressing, ---- ---- , flow control.
Data link	Framing, ---- , access control.

Ans. to the q. no- 2(b)

Bandwidth 1 MHz = B

and SNR is 63

So,

$$\text{Bit rate} = \text{Bandwidth} \times \log_2\left(1 + \frac{\text{Signal Power}}{\text{Noise Power}}\right)$$

$$= 10^6 \times \log_2(1+63)$$

$$= 10^6 \times 6 = 6 \text{ Mbps} \quad \text{(Ans.)}$$

Signal level $= 2 \cdot B \log_2 M$ (bps)

Ans.

Ans. to the q. no-2 (c)

Bandwidth $= 4\,kHz = B$

Data (Bit rate), $C = 100\,kbps$

$\therefore 100\,kbps = (4 \times 1000)\log_2(1+SNR)$

$\Rightarrow 100 \times 1000 = 4000 \log_2(1+SNR)$

$\Rightarrow \log_2(1+SNR) = 25$

$\Rightarrow 1 + SNR = 2^{25}$

$\therefore SNR = 33554431$

$\therefore SNR_{dB} = 10 \log_{10}(33554431)$

$\therefore SNR_{dB} = 75\,dB$

Ans.

Ans to The q no-2(d)

Bandwidth is = 4000 Hz

SNR = 20

∴ Max data rate =

$= 4000 \times \log_2 (1+20)$

$= 4000 \log_2 21$

$= 4000 \times 4.3923$

$= 17569.26$ bps

Max data rate = 17.57 Kbps of telephone line

(Ans.)

Ans to the q. no-3 (a)

TCP/IP Layer	Protocol
Data Link layer	SDLC, HDLC, SLIP, PPP etc Protocols defined by underlying net.
Network	ICMP, IGMP, (IP), RARP ARP
Application layer	TELNET, SMTP, DNS, FTP
Transport layer	TCP, UDP

Ans. to the q. no-3(b)

Point A power is = 100 W ; Point B power = 90 W. (A is input, B is output)

Attenuation in db = $10 \times \log_{10}\left(\frac{\text{input power}}{\text{output power}}\right)$

$= 10 \times \log_{10}(100/90)$

$= 10 \times 0.045774$

∴ Attenuation is = 0.457574 db

(Ans.)

Ans. to the q. no-3 (c)

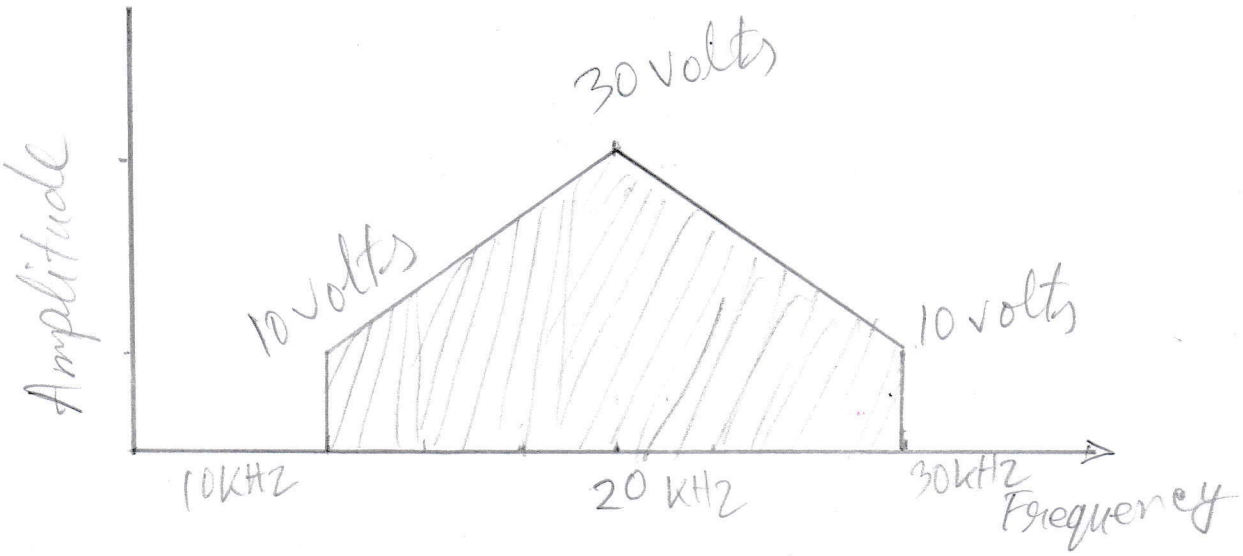


Fig: Frequency Spectrum.

Ans. to the q. no-3(d)

A sinewave has zero bandwidth regardless of its frequency. 100 Hz ~~or~~ or 200 Hz sin wave some, zero; 0, bandwidth, carries no data.

Ans. to the q. no-3(e)

Ans. to the q. no-3(e)

We know,

$$\text{Transmission time} = \left(\frac{\text{Packet length}}{\text{Bandwidth}}\right)$$

$$= \frac{1 \text{ million bytes}}{200 \text{ kbps}}$$

$$= \frac{1 \text{ million} \times 8}{200 \text{ kbps}}$$

$$= \frac{8000000}{200000 \text{ bps}}$$

$$= 40 \text{ seconds. (forty seconds)}$$

Single packet transmission time = 40 seconds (Ans.)