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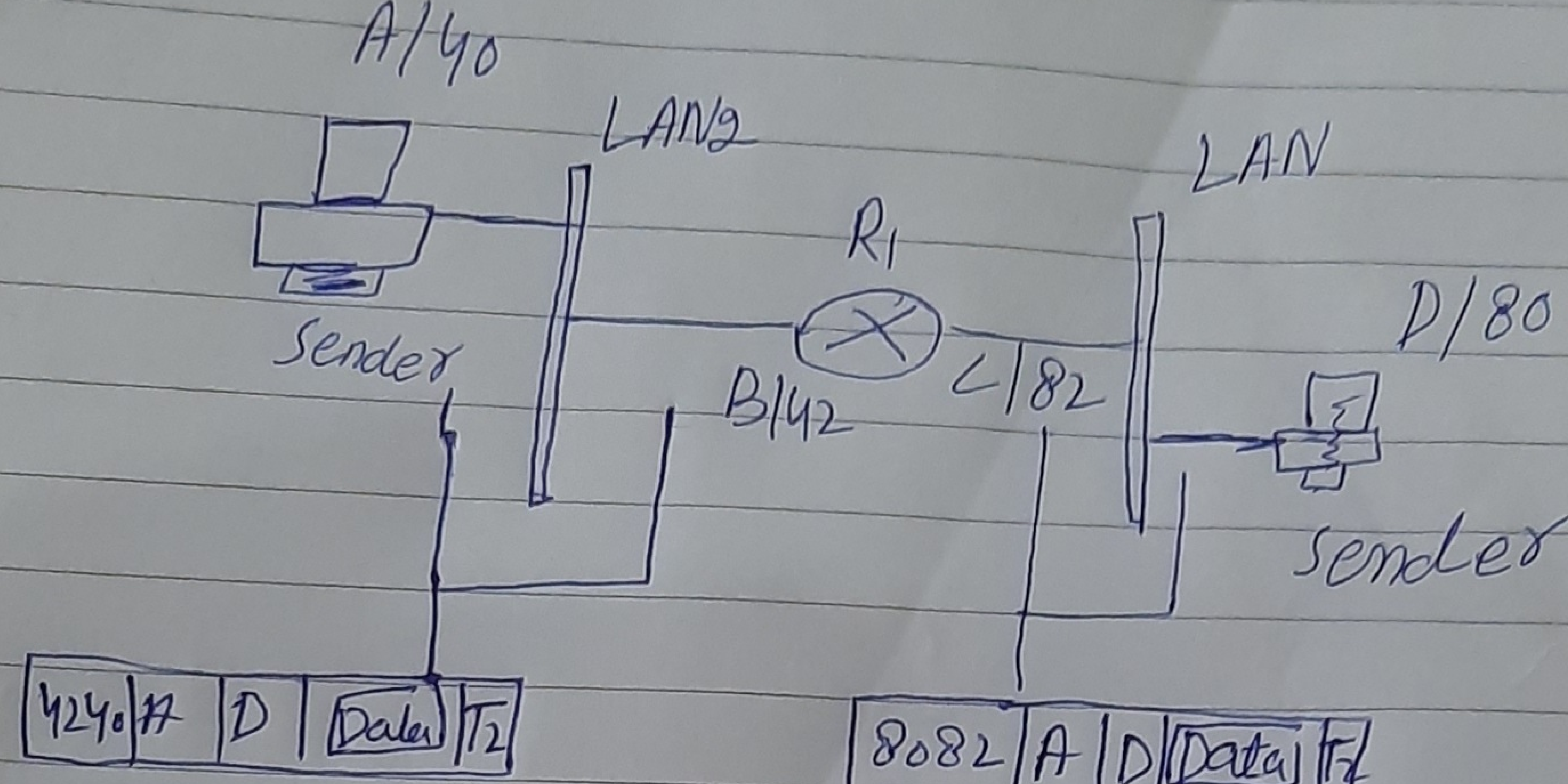
prog B-S Telecom

Subject Introduction to Telecom.

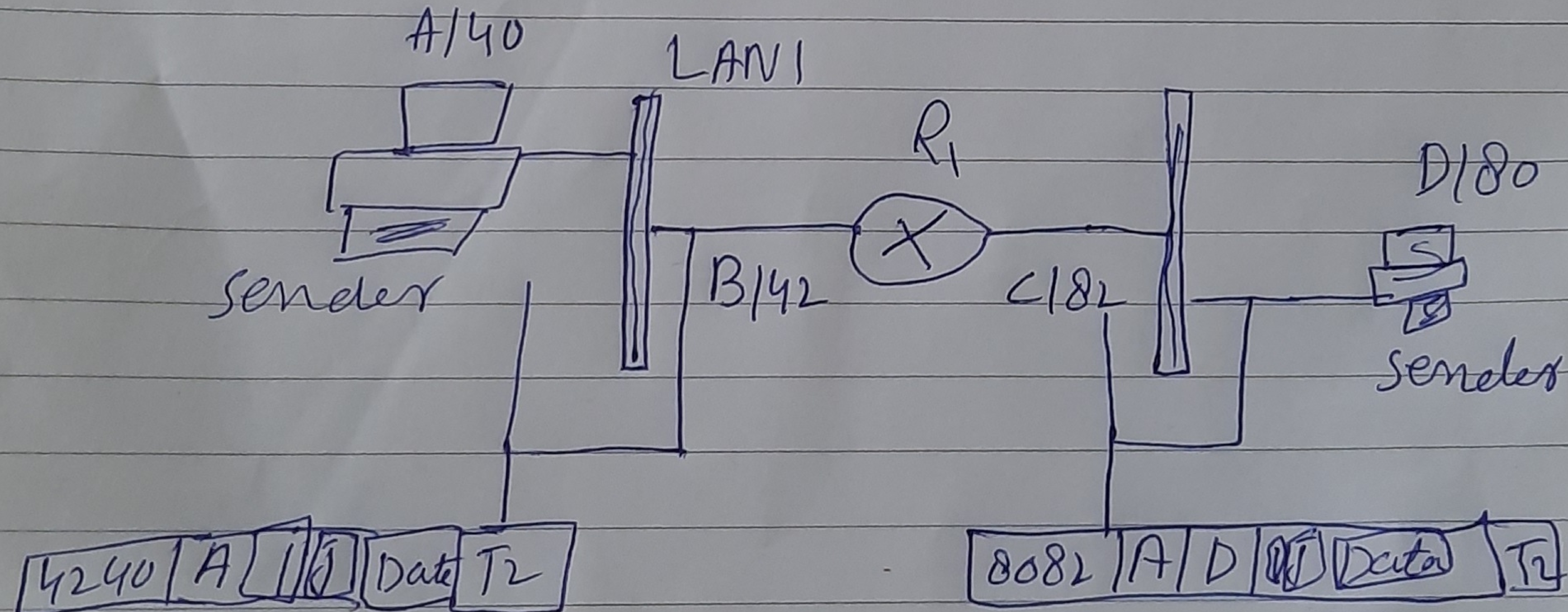
Q1:.

(a) For Figure below, computer- - - - - - - - -
- - - - - - - - - - - - - - - - - -
interface:: - - - - - - - - - - - - - - each hop

Ans::



Assume that the - - - - running computer A - - -
- - - - - - port - - - - running computer D - - - -
port address J - - - -



(2)

Qb:-

Discuss briefly the main responsibilities of each layer of OSI model:-

Ans:-

Physical layer:-

* The lowest layer of the OSI model is concerned with electrically or optically transmitting raw unstructured data bits across the network from the physical layer of the sending device to the physical layer of the receiving device it can include specifications such as voltage, pin layout, cabling and radio frequencies.

② Data link layer:-

At data link layer directly connected nodes are used to perform node-to-node data transfer where data is packed into frames. The data link layer also corrects errors that may occured at th phy layer

③ Network Layer:-

The network layer is responsible for receiving frames from the data link layer and delivering them to their intended destinations among based on the addresses contained inside the frame the network layer finds the destination by using logical addresses such as ip.

④ Transport Layer

The transport layer manages the delivery and error checking of data packets. It regulates the size, sequencing. and ultimately the transfer of data between systems and hosts example is TCP.

⑤ Session Layer:-

The session layer controls the conversations between different computer. A session or connection between machines is set up managed and termined at layer 5

(5) ∴ Presentation layer ∴

The presentation layer formats or translates data for the application layer based on the syntax or semantics that the application accepts.

(6) ∴ Application layer ∴

At this layer. both the end users and the application layer interact directly with the software application

Q2@ Given an amplifier with an effective noise temp of 11000K and a 12MHz bandwidth. what thermal noise level in dBW may we expect at its output?

Ans ∴ calculate Thermal noise level

T = Effective ~~Thermal~~ noise Temp = 11000K

B = Bandwidth = 12MHz

= 11^{1+6} x 12 Hz : (1MHz = 10^6 Hz)

B = 10^{1+6} H ($a^m \times a^n = a^{m+2}$

= B = 10^7 Hz : K = Boltzmann's constant = 1.38×10^{-23} J/K

Q2 Part (b)

What is the channel capacity for a Tele-printer channel with a 450 Hz bandwidth and a signal to noise ratio of 6dB where the noise is white thermal noise?

Ans:- Given data

Bandwidth (B) = 450 Hz

Signal to noise ratio (SNR) dB = 6dB

$= 10 \log_{10}(SNR)$

$= \log_{10}(SNR) =$

$\log_{10}(SNR) \frac{6}{10} = 0.6$

$= SNR = 10^{0.6}$ Ans

Q2 Part (c) Given a channel with an intended capacity of 22 Mbps the bandwidth of the channel is 4Hz Assuming white thermal noise what signal to noise ratio is required to active this capacity?

Ans:- $C = 20$ MbPS, $B = 4$ MHz

From $C = B \log_3(1 + SNR)$

Therefore $SNR = 3^{\wedge}(C/B) - 1$

So $SNR = 100.5937$ SNR

$db = 10 \log_{10}(SNR) = 20.03$ dB.

of ...ice?

(6)

Q3 Part (A) A digital signalling system is required to operate at 9600 Mbps if a signal element encodes a 8 bit word what is the minimum required bandwidth of the channel?

Answer:

Using Nyquist's equation $L = 2B\log_2 M$

$\text{Log}_2 m = 8$ because a signal element encodes a 8 bit word

Therefore $L = 9600 = 2B * 8$

$B = 600\,Hz$.

Q3 part b:

If the received signal level For a particular digital system is $-150\,dBW$ and the receiver system effective temperature is 1700 K what is E_b/N_o For a link Transmitting 2600 bps?

Ans:

$(Eb/N_o) = -150dBW - 10\log 2600 - 10\log 1700 +$

$228.6\,dBW = 14\,dBW$ Ans.