Ans to the Q. No. -1

TCP/IP model has 4 layers. Their protocols, PDUs, special tasks, etc are given below,

i. Network access layer: This layer does the same job as physical layer and datalink layer of OSI model. It is responsible for movements of individual bits from one hop to the next hop. This layer handles encoding of bits, transmission rate and synchronization of bits. The other part of this layer divides bits received from upper layer into managable units which is called "frame". A header is added to the frame to define the sender or receiver, which is called physical addressing. Flow control, Error control and Access control is also a part of this layer.
key protocol: Ethernet, WiFi.

ii. Internet layer: The internet layer is responsible for delivering packets, possibly across multiple networks. If two systems are not on the same network, this layer is needed. This layer adds a header to the packet coming from upper layer. which includes the logical address of sender and receiver. This layer also does routing.
Protocol: IP, ICMP, ARP, RARP.

iii. Transport layer: It is responsible for process to process delivery of the entire message. It ensures that the whole message arrives intact and in order. Manages connection control, flow control, error control. Its primary data unit is segment. This layer divides a message into segments with port address and reassembles on arrival.
Protocol: TCP, UDP

iv. Application layer: The applicatio layer of TCP/IP model is the combination of session, presentation and application layer of OSI model. This layer is responsible for dialogue control and synchronization. It also changes information to bit and vice versa, handles encryption, decryption and compression. This layer gives services to user. In this layer message is normally in human readable language or data.
Protocol: HTTP, FTP, DNS.

Ans. to the Q. No.-2

In a bus topology LAN, all the devices are connected with the same transmission medium. When a frame is sent all the devices on the network will receive the frame. Each device checks if the destination MAC address matches its own. Since the address is corrupted no device accepts the frame. As no one received the frame, if the sender doesn't have a copy it will be lost. But it doesn't happen as the error control feature of data link layer uses mechanisms to detect and retransmit damaged or lost frames.

Ans. to the Q. No.-3

Yes, I can identify the layer of the OSI model the resembles such procedure. It is session layer. This layers main task is dialogue control and synchronization. This ~~sessio~~ layer add check points during data transmission. If the transmission is disrupt or software

crashes this layer starts sending files from the last check point. Thus during gameplay one can return to the last saved point and session layer are similar.

Ans. to the Q. No.- 4

a) Application layer.

b) Data link layer and transport layer

c) physical layer.

Ans. to the Q. No.- 5

b a) bandwidth = 1 MHz $= 1 \times 10^6$ Hz

$$SNR = \frac{1533}{3} = 511$$

maximum capacity, $C = \text{bandwidth} \times \log_2(1 + SNR)$

$$= 1 \times 10^6 \times \log_2(1+511)$$

$$= 9000000$$

$$= 9 \text{ Mbps}$$

b) bitrate $= 9000000 \times 75\%$

$= 6750000$ bps

$\therefore$ bitrate $= 2 \times$ bandwidth $\times \log_2 L$

$\Rightarrow 6750000 = 2 \times 1 \times 10^6 \times \log_2 L$

$\Rightarrow L = 10.374 \approx 16$

As the signal level has to be integer and has to be a power of 2.

Ans. to the Q. No.-6

In the diagram there are maltiple computers connected with three switches which are also connected to three different routers. These routers are connected with each other. These three switches makes three individual lan. Here lan and Routers have 1 to 1 connection which won't increase lan number. The 1st hop that the data has to go from source PC1 to R1.

Ans. to the Q. No.- 7

a) Internet layer.

b) Network access layer.

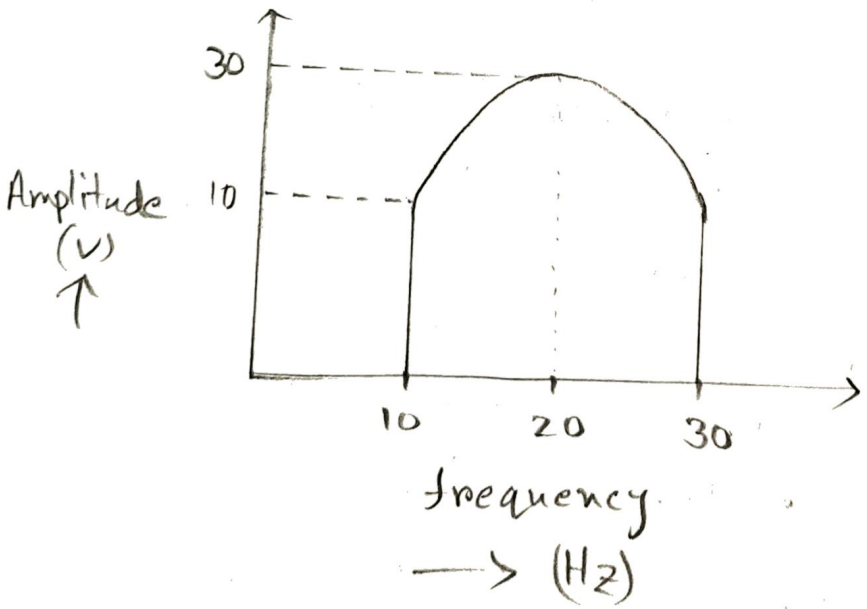
c) Application layer.

d) Internet layer.

e) Network access layer.

f) Application layer.

Ans. to the Q. No.- 8



Ans. to the Q. No. 9

a) bitrate $= (108 \times 10^9 \times 8) / (8 \times 3600)$

$= 30000000$ bps

bandwidth $= 13 \times 10^6 - 800 \times 1000$

$= 12200000$ Hz

$\therefore$ bitrate $= 2 \times$ bandwidth $\times \log_2 L$

$\Rightarrow 30000000 = 2 \times 12200000 \times \log_2 L$

$\Rightarrow L = 2.34 \approx 4$

b) $SNR = \frac{20 \times 30}{30} = 20$

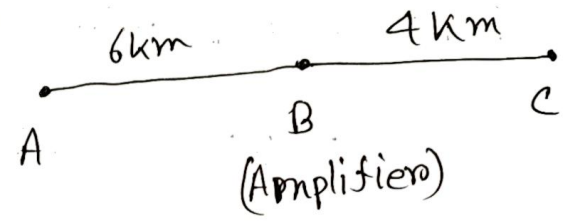
$\therefore C =$ bandwidth $\times \log_2 (1 + SNR)$

$= 12200000 \times \log_2 (1+20)$

$= 53586272.56$ bps

Ans. to the Q. No.-10

$P_A = 20W$



3 W/km deteriorate

$\therefore P_B = 20 - 3 \times 6$

$= 2W$

There is a amplifier in B.

So new $P_B = 2 \times 15 = 30\ W$

$P_C = 30 - 3 \times 4$

$= 18\ W$

from A to B,

$$dB_{AB} = 10 \log_{10} \frac{P_2}{P_1}$$

$$= 10 \log \frac{2}{20}$$

$$= -10$$

After amplifying,

$$dB_{BB} = 10 \log_{10} \frac{30}{2}$$

$$= 11.76$$

from B to C,

$$dB_{BC} = 10 \log_{10} \frac{18}{30}$$

$$= -2.22$$

$$\therefore \text{Total attenuation} = -10 + 11.76 - 2.22$$

$$= -0.46$$