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CN Assignment - 1

Ques 1. What are the three criteria necessary for an effective and an efficient network?

Ans 1. The 3 criteria necessary for effective and efficient network are:-

a) PERFORMANCE: It's a measurement of various factors such as the amount of time required for message to travel from one device to another, the time it requires to get a response starting from one enquiry. It also depends on the no. of active users, transmission media, etc.

b) RELIABILITY: It is measured by the frequency of failure, time it takes to recover from failure, the network's robustness

c) Security: The data that is sent should reach its destination safely without any third party reading, altering or destroying it in the midway.

Ques 2. What are the three fundamentals characteristics to determine the effectiveness of the data communication system?

Ans The effectiveness of two data communication system depends on 3 fundamental characters:

1) delivery → The system must deliver the data to the correct destination
2) Accuracy → The system must deliver data accurately.
3) Timeliness → The system must delives data in timely manner.

Ques 3. What are the criteria used to evaluate transmission medium?

Ans Criterias for evaluating the transmission media are:

1) Throughput
2) Propagation Time
3) Propagation speed
4) Wavelength

Ques 4. What are the network support layers and the user support layers?

Ans

NETWORK SUPPORT LAYERS

1. Physical layer
2. Data link Layer
3. Network Layer

USER SUPPORT LAYERS

1. Session Layer
2. Presentation Layer
3. Application layer

→ The physical layer, data link layer and the network layer are the network support layers. These layers manage a physical transfer of data from one device to another. (2)

→ Session layer, presentation and application layer are the user support layers. These layers allow communication among unrelated software in dissimilar environments.

N/W layer deals with electrical specifications, physical connection, transport timing and reliability.

User support layer allows interperability among unrelated software system.

Ques 5. Why we migrate from IPv4 to IPv6 ?

Ans IP is short for Internet Protocol, the standard for transferring data over the internet in the form of datagrams. IPv6 is the next-gen internet protocol version which is an upgrade over the previous v4.

Major difference is the bit address.

Migrating doesn't mean replacing IPv4 with IPv6. It just means enabling IPv6 along with IPv4.

So we migrate from IPv4 to IPv6 because of the following reasons.

1. Makes routing efficient
2. End to end transparency
3. Faster packet processing
4. Security
5. Quick Data flows

Ques 6. Why ethernet is said to be 1-persistant protocol ?

Ans Ethernet is said to be 1-persistant protocol because whenever adaptor has a frame to send and the line is busy, it waits for the line to go idle and then as and when it becomes idle it transmits the frame immediately over the line. Hence, ethernet follows 1-persistant protocol.

Ethernet said to be 1-persistent protocol as it has an adapter with a frame to send transmits with probability '1' whenever a busy line goes idle.

Ques 7. Suppose we want to transmit the message 10110010010011

errors using the CRC-8 polynomial $x^8 + x_2 + x_1 + 1$

a) Use polynomial long division to determine the message that should be transmitted.

b) Suppose the leftmost bit of the message is inverted due to noise on the transmission link.

Ans

$x^8 + x_2 + x_1 + 1$

$1x^8 + 0x_7 + 0x_6 + 0x_5 + 0x_4 + 0x_3 + 1x_2 + 1x_1 + 1$

100000111 → divison

a)

```
100000111 ) 10110010 0100 1011 00000000 ( 10010001010101001
            100000111
            ---------
             110001110
             100000111
             ---------
              10001010
              10000111
              ---------
               101011011
               100000111
               ---------
                101010000
                100000111
                ---------
                 111011100
                 100000111
                 ---------
                  110110110
                  100000111
                  ---------
                   101100010
                   100000111
                   ---------
                    110010100
                    100000111
                    ---------
                ←   [10010011]
```

add bits

so number will be transmitted as:

1011 0010 0100 1011 1001 0011 ← added bits

b)

```
100000111 ) 0011001001001011 010010011 ( 11001011010111
              100000111
              ---------
              100101010
              100000111
              ---------
               0010110110 1
                100000111
                ---------
                 0110101010
                 100000111
                 ---------
                  101011011
                  100000111
                  ---------
                   010111000
                   100000111
                   ---------
                    0111011110
                    100000111
                    ---------
                     110110010
                     100000111
                     ---------
                      101101011
                      100000111
                                      01101100
```

error = 11011001