

IQRA NATIONAL UNIVERSITY



Computer Communication Network **Final Term Assignment Summer 2020**

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⇒ Question No (1)

⇒ Part (A)

⇒ Suppose a computer sends a packet at the transport layer to another computer. Some where in the internet there is no process with the destination port address running at the destination computer. What will happen?

Answer:- Suppose a computer sends a packet at the transport layer to another computer. Some where in the internet there is no process with the destination port address running at the destination computer. Then most protocols issue a "special error message" that is sent back to the source because the transport layer is responsible for the delivery of a message from one process to another.



⇒ Question No (2)

⇒ Part (A)

⇒ The signal to noise ratio is often given in decibels. Assume the $SNR_{dB} = 36$ and the channel bandwidth is 2 MHz. Calculate the theoretical channel capacity?

Solution:-

$$SNR_{dB} = 10 \log_{10} SNR$$

$$SNR = 10^{SNR_{dB}/10}$$

$$SNR = 10^{3.6} = 3981$$

$$C = B \log_2 (1 + SNR) = 2 \times 10^6 \times \log_2 3982$$

$$= \boxed{24 \text{ Mbps}}$$

Answer:-



=> Question NO (2)

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=> Part (B)

=> What is the bit rate of each of the following signals?

(a) A signal in which 1 bit lasts 0.001 s

(b) A signal in which 1 bit lasts 2ms

(c) A signal in which 10 bits last 20 micro-sec.

=> Solution:-

(a) Bit rate = $1 / 0.001 = 1000 \text{ bits/second}$

(b) Bit rate = $10 / 20 \times 10^6 = 500 \text{ K bits/seconds}$

(c) Bit rate = 1000 bits/seconds since the device is sending 1000 bits every 250 cycle per second there fore 1000 bits is being transmitted every second.



=> Question No (3)

=> Part (i)

What are three criteria necessary for an effective and efficient network?

Answer :- Criteria necessary for effective and efficient network

(a) Performance

it can be measured in many ways including transmit time and response time.

(b) Reliability

it is measured by frequency of failure the time it takes a link to recover from a failure and the network's robustness.

(c) Security

Security issues includes protecting data from unauthorized access and viruses.

⇒ part (ii)

What is the difference between half duplex and full duplex transmission modes.

Answer :- A full duplex device is capable of bi-directional network data transmissions at the same time half duplex devices can only transmit in one direction at one time with half duplex mode data can move in two directions but not at the same time.



Part (iii)

⇒ For n devices in a network what is the number of cable links required for a mesh, ring, bus and star topology?

Answer: ⇒ $n(n-1)/2$

Cable links are required for mesh

⇒ n

for ring

⇒ $n-1$ cable links

for bus

⇒ n cable links

for star topology.



⇒ Part (iv)

⇒ What are the concerns of the Physical layer in internet model.

Answer: The Physical layer is concerned with actual transfer of data bits across a transmission medium between two devices.

it deals with the mechanical and electrical specifications of the interface and transmission medium.



⇒ Part (v)

⇒ Name some services provided by the application layer in the internet model?

Answer The services provided by the application layer in the internet model are.

- ⇒ Network virtual terminal
- ⇒ File transfer access and management
- ⇒ Mail services
- ⇒ Directory services



⇒ Part (vi)

⇒ How do the layers of the internet model correlate to the layers of OSI model?

Answer :- The TCP/IP Protocol Suite was developed prior to the OSI model.

The first four layers provide physical standards network interfaces, internetworking, and transport functions that correspond to the first four layers of the OSI model. The original TCP/IP protocol suite was defined as having four layers Host to Host network, internet transport and application however when TCP/IP

⇒ However when TCP/IP is compared to OSI we can say that host to network layer is equivalent to the combination of Physical and data link layer is equivalent to the network layer and the application layer is roughly doing the job of Session presentation and application layer with transport layer in TCP/IP taking care of part of duties of the session layer so we assume that TCP protocol is made of five layers Physical data link, network, transport and application.



=> Part (vii)

=> What does the amplitude of a signal measure? What does the frequency of a signal measure? What does the phase of the signal measure?

Answer:- The amplitude of a signal measures the value of the signal at any point. The frequency of a signal refers to the number of periods in one second.

=> The phase describes the position of the waveform relative to time zero.

Frequency is the rate of change of a periodic signal with respect to time. Its unit of measurement is hertz.

→ The frequency of the wave is the inverse value of its period and it is measured in Hertz or Hz. 1 Hz (Hertz) = 1/Second For a 1 Second Period

The frequency of the wave is 1 Hz

The amplitude of a signal measures the value of the signal at any point

The frequency of the signal refers to the number of periods in one

⇒ Second The phase describe the position of the waveform relative to time zero one of the most cardinal home of your a digital sound inticate will be it is bounky.



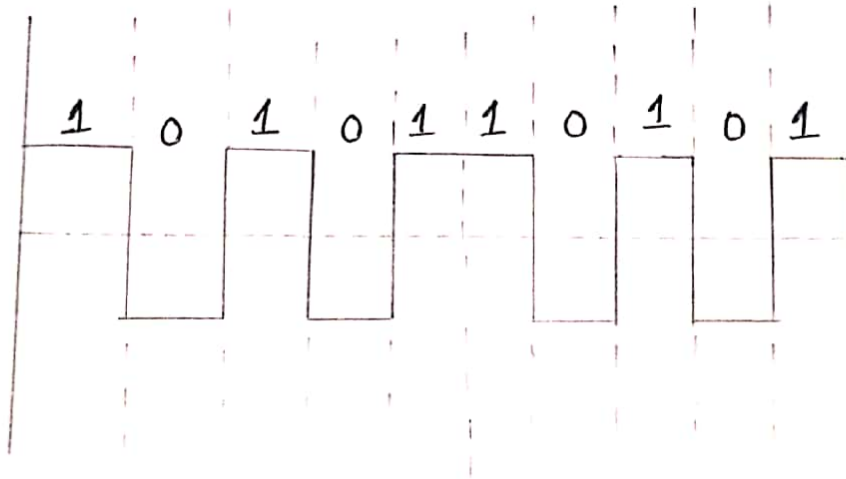
⇒ Question No (4)

⇒ Part (a)

⇒ Convert the bit stream 1010110101 for the following schemes.

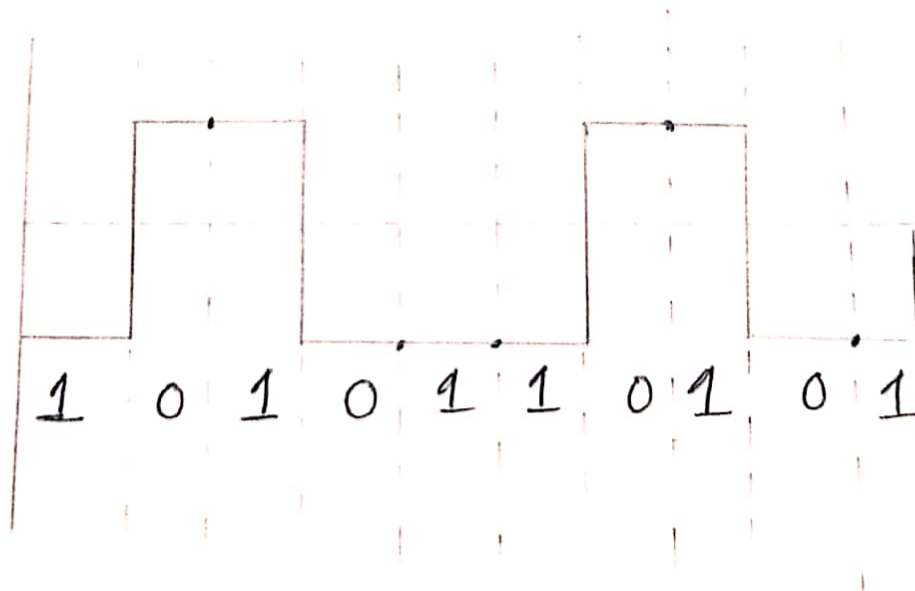
(a)

NRZ-L



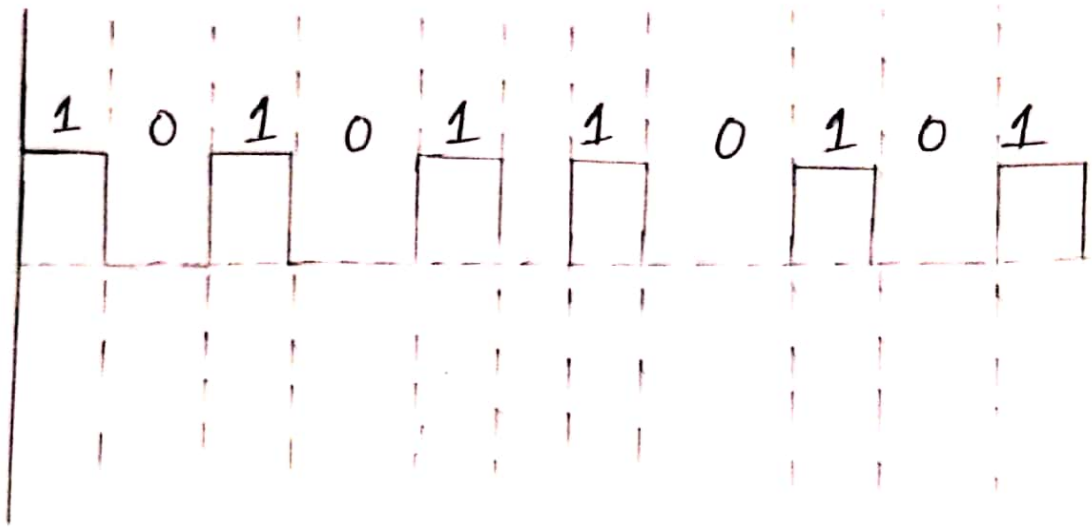
(b)

NRZ-S



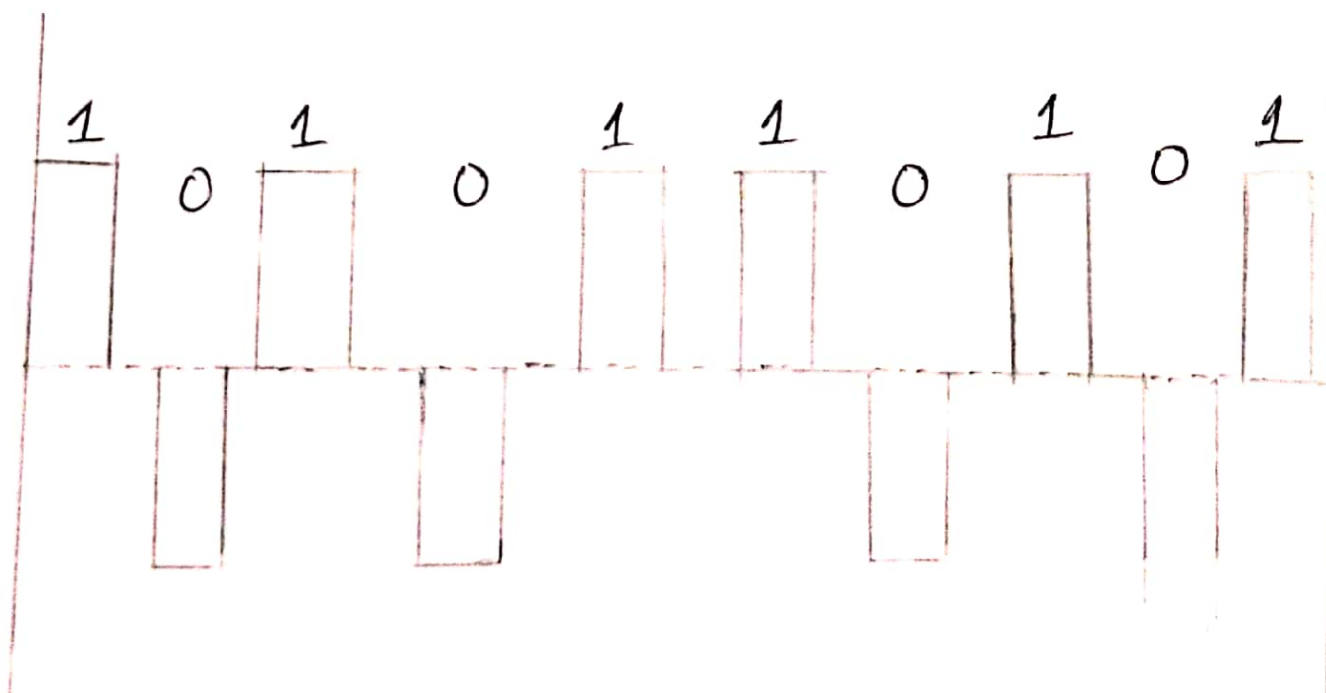
(c)

UNIPOLAR-RZ



(d)

BIPOLAR-RZ



=> Question NO (4)

=> part (B)

=> what is the total delay (Latency) from a frame size of 5 million bits that is being send on a link with 10 routers each having 2 μ s and processing time of 1 μ s length is 2000km.....?

Solution :- => Propagation time = distance /
Propagation Speed.

$$= 2000 \text{ km} / 2 \times 10^8 \text{ m/s} = 10 \text{ ms}$$

=> Transmission time = Message size /
Bandwidth

$$= 5 \times 10^6 \text{ bits} / 5 \text{ Mbps} = 1 \text{ s}$$

=> Queuing time = 10 routers * 2 μ s = 20 μ s

=> Processing Delay = 10 routers * 1 μ s = 10 μ s

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$$\Rightarrow \text{Total delay (Latency)} = 10\text{ms} + 1\text{s} + 20\mu\text{s} + 10\mu\text{s}$$

$$= 1010.03 \text{ ms} = 1.01003 \text{ s} \approx 1 \text{ s}$$

Answer

Thank You.
