



7. The Ethernet address length is:
- a. 48 bits
  - b. 52 bits
  - c. 128 bits
  - d. 60 bits
8. To find the type of the address, we need to look at the \_\_\_\_\_ hexadecimal digit from the left.
- a. second
  - b. first
  - c. third
  - d. fourth
9. An ARP request is normally:
- a. Multicast
  - b. Broadcast
  - c. Unicast
  - d. None of the above
10. Considering link layer context, DLC is the abbreviation or short form for:
- a. Data layer control
  - b. Data link control
  - c. Datagram link configuration
  - d. None of the above

[10 Marks]



Q1) Choose ONE correct answer from each of the following MCQs.

1. The data link layer is not responsible for:
  - a. detection and correction of damaged and lost frames
  - b. data rate control
  - c. framing data bits
  - d. file transfer
2. Frequency and period are:
  - a. directly proportional to each other
  - b. inverse of each other
  - c. the same
  - d. are not related
3. \_\_\_\_\_ is the rate of change with respect to time.
  - a. Amplitude
  - b. Time
  - c. Frequency
  - d. Phase
4. For a \_\_\_\_\_ channel, we need to use the Shannon capacity to find the maximum bit rate.
  - a. Noisy
  - b. Noiseless
  - c. Band-pass
  - d. Low-pass
5. Transmission media are directly controlled by the:
  - a. Physical layer
  - b. Data link layer
  - c. Network layer
  - d. Session layer
6. Which of the following is an example of a controlled access protocol?
  - a. CDMA
  - b. TDMA
  - c. Token passing
  - d. None of the above



e) List three advantages of a Fiber-optic cable over other cables.

- ① less installation ✗
- ② light ✓
- ③ glass or plastic cable ✗

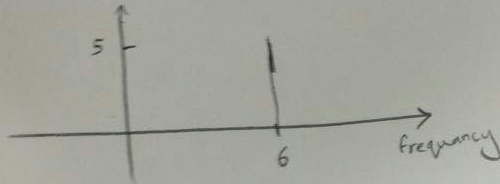
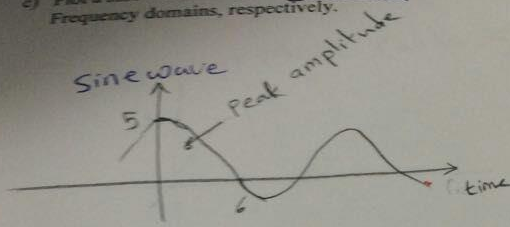
f) Distinguish between a Link and a Node.

[3 Mar]

link: between ~~of~~ ~~devices~~ two or more devices

node: ~~between of~~ device and router or modem or S

c) Plot a sine wave with peak amplitude of 5 Volts and frequency of 6 Hz in Time and Frequency domains, respectively.



1  
2  
✓

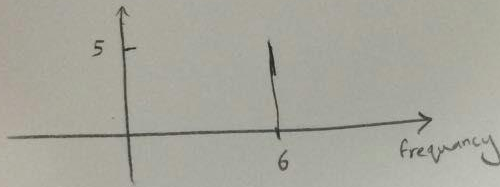
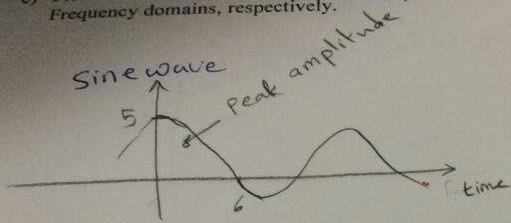
3  
[4 Mar]

d) What are the two advantages of using the Bridge in a network?

- ① divide the network to two or more network
- ② reduce the chance of collision — 1.5
- ③ improve effective.

The bandwidth each station less. more

c) Plot a sine wave with peak amplitude of 5 Volts and frequency of 6 Hz in Time and Frequency domains, respectively.



3  
[4 Marks]

d) What are the two advantages of using the Bridge in a network?

- ① divide the network to two or more network
- ② reduce the chance of collision — 1.5
- ③ improve effective.

The bandwidth each station less. more





Q5) To generate chip sequences for CDMA (code division multiple access), we normally use a Walsh Table. Create a Walsh Table considering four "4" stations/devices. Then, write the "Chipping Sequences" for each station/device.

$$w_1 = [+1]$$

$$w_2 = \begin{bmatrix} +1 & +1 \\ +1 & -1 \end{bmatrix}$$

$$w_4 = \begin{bmatrix} +1 & +1 & +1 & +1 \\ +1 & -1 & +1 & -1 \\ +1 & +1 & -1 & -1 \\ +1 & -1 & -1 & +1 \end{bmatrix}$$

$$w = \begin{bmatrix} w & w \\ w & w \end{bmatrix}$$

6

h station of equal to row and ~~col~~ and ~~contm~~  
2

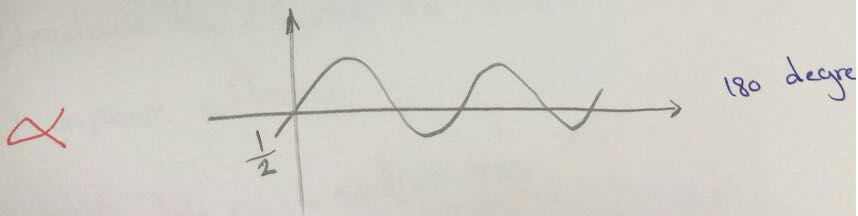
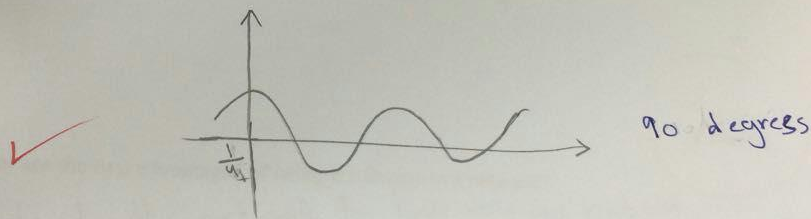
**Q4) Answer the following questions briefly.**

a) How would you differentiate between a MAC address and a Hardware address? What is the length of an IP address in Bits?

IP address is logical address : it's 32 address ✓  
MAC address is Physical address : it's 48 address ✓

3  
[3 Marks:]

b) Draw two sine waves showing 90 degrees and 180 degrees phase shifts.





Q3) Fill-in each blank with the most suitable word from the table.

<del>Circuit</del>	<del>Phase</del>	<del>Attenuation</del>	<del>Coaxial</del>	<del>CRC</del>
Packet	Amplitude	Distortion	Fiber-optic	SFD

1. The Internet is an example of Circuit switched network.
2. phase describes the position of a waveform relative to time 0.
3. Attenuation is a type of transmission impairment in which the signal loses strength due to the resistance of the transmission medium.
4. BNC connectors are normally used with Coaxial cables.
5. In an Ethernet frame, CRC field is responsible for error detection.

[5 Marks]