Sample Questions from Unit 2 & Unit 3

1. A block of addresses is granted to an organization like SRM and we know that one of the addresses is 205.16.32.36/29. Find the first address, last address and number of addresses in the block?

2. Given the IP addresses 192.168.32.0 /24, 192.168.64.0/24 and 192.168.10.0/24 find the supernet address and subnet mask.

3. Given the Ip address 12.16.12.17/14, Compute network and broadcast address for first two subnets.

4. Using Class C IP address 192.168.1.1/24 an organization wants to create 3 subnets, calculate the subnet mask, network and broadcast address of all 3 subnets.

5. Given the Ip addresses 192.168.128.0/26, 192.168.224.0/24 find the supernet address and its wildcard mask.

6. Find the total number of subnets and the Number of valid hosts in each subnet for the given IP address. Network Address- 192.168.1.0 Subnet Mask- 255.255.255.192

7. Define Address Aggregation. Aggregate the following set of four /24 IP network addresses to the highest degree possible
   212.56.132.0/24
   212.56.133.0/24
   212.56.134.0/24
   212.56.135.0/24

8. Identify the supernet address for
   172.168.1.32/28
   172.168.1.48/28
   172.168.1.128/28
   172.168.1.144/28
   172.168.1.160/28
   172.168.1.176/28

9. Identify the supernet address for
   122.128.58.0/29
   122.128.58.48/29
   122.128.58.64/29
   122.128.58.72/29
   122.128.58.80/29
   122.128.58.56/29

10. Assume that an organization uses class C addressing and the number of bits used for subneting is 5. How many subnets are possible in the organization? How many host addresses are available per subnet?

11. You are given a Class B network (172.16.0.0) and you have 490 subnets in your network, where the largest segment needs 112 host addresses. What subnet mask should you use and what is the layout of your addresses?

12. You are given a Class A network (10.0.0.0) and you have 9,000 subnets in your network, where the largest segment needs 560 host addresses. What subnet mask should you use and what is the layout of your addresses?

13. You are given the following address: 172.16.4.255/255.255.252.0. Find the network, directed broadcast, and usable host range?

14. An analog signal has a bit rate of 4000 bps and a baud rate of 500 baud. How many data elements are carried by each signal element? How many signal elements do we need?

15. A periodic signal is decomposed into five sine waves with frequency starting from 100 Hz and the difference between the adjacent frequency is 200 Hz. Calculate the its bandwidth. Further calculate the maximum bit rate if the signal has two signal elements

16. In a digital transmission, the source clock is 0.3 percent faster than the destination clock. How many more extra bits per second does the source send if the data rate is 1 Mbps?

17. Calculate the bit rate for the signal with 2000 baud if the ASK is used for modulation

18. Calculate the value of the signal rate for i) r= 1 ii) r=1/2 iii) r=2 if the data rate is 1 Mbps and c = ½ Consider the noiseless channel transmitting a signal with four signal levels (for each level, we send 2 bits). What is the maximum bit rate?

19. A telephone line normally has a bandwidth of 3000 Hz (300 to 3300 Hz) assigned for data communications. The signal-to-noise ratio is usually 3162.What is the Channel Capacity?

20. Write the steps involved in Quantization process.

21. State the two rules used in High-density bipolar 3-zero (HDB3) scrambling technique.

22. Define the following.   (i) Nyquist theorem (ii) Quantization Error.

23. List and brief the different modes used for propagating light along optical channels in fibre optic Communication

24. State where Radio waves, Microwaves   and Infrared signals are used in Communication.