Question 4: An ISP is granted a block of addresses starting with 170.25.96.0/20. The ISP needs to distribute these addresses to three groups of customers as follows:

[2+4.5+4.5 = 11 Marks] (CLO 3)

- The first group has 8 customers: each customer needs 256 addresses (including network and broadcast).
- The second group has 16 customers: each customer needs 64 addresses (including network and broadcast).
- The third group has 64 customers: each customer needs 16 addresses (including network and broadcast).

The IT department of ISP designs the sub-block (subnets) for each group of customers strictly according to addresses required by customers in each group.

You are required to answer the following questions with respect to this scenario. Make sure that IP addresses are necessarily written in dotted decimal notation.

I. Write the subnet mask for each group of customers. [2]

Answer:

Subnet mask for first group customers:

Subnet mask for third group customers:

II. Write the network address for 1st customer of each group: [1.5+1.5+1.5]

Answer:

Network address of 1st customer of first group:

Network address of 1st customer of second group:

Network address of 1st customer of last group:

III. Write the broadcast address of last customer of each group: [1.5+1.5+1.5]

Answer:

broadcast address of last customer of first group:

broadcast address of last customer of second group:

broadcast address of last customer of third group:

Solution

Question 04: An ISP is granted a block of addresses starting with 170.25.96.0/20. The ISP needs to distribute these addresses to three groups of customers as follows: **[2+4.5+4.5 = 11 Marks] (CLO 3)**

- The first group has 8 customers: each customer needs 256 addresses (including network and broadcast).
- The second group has 16 customers: each customer needs 64 addresses (including network and broadcast).
- The third group has 64 customers: each customer needs 16 addresses (including network and broadcast).

The IT department of ISP designs sub-block (subnets) for each group of customers strictly according to addresses required by customers in each group.
You are required to answer the following questions with respect to this scenario. Make sure that IP addresses are necessarily written in dotted decimal notation.

IV. Write the subnet mask for each group of customers. [1+1]

Answer:
Subnet mask for first group customers: 255.255.255.0

Subnet mask for third group customers: 255.255.255.240

V. Write the network address for 1st customer of each group: [1.5+1.5+1.5]

Answer:
Network address of 1st customer of first group: 170.25.96.0/24

Network address of 1st customer of second group: 170.25.104.0/26

Network address of 1st customer of last group: 170.25.108.0/28

VI. Write the broadcast address of last customer of each group: [1.5+1.5+1.5]

Answer:
broadcast address of last customer of first group: 170.25.103.255/24

broadcast address of last customer of second group: 170.25.107.255/26

broadcast address of last customer of third group: 170.25.111.255/28