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Network & Communication
Assignment - 1
IP addressing & Subnetting exercises

[A] 1. Given Ip :→ 172.16.110.5
Mask :→ 255.255.192.0
The Given Ip belongs to 'B' class
192 ⇒ 11000000
hence 2 bits are used for subnet
possible subnets = $2^2 = 4$
00000000 = 172.16.0.0
01000000 = 172.16.64.0
10000000 = 172.16.128.0
11000000 = 172.16.192.0

For given IP address :→
subnet :→ 172.16.64.0
first add. :→ 172.16.64.1
last add. :→ 172.16.127.254
Broadcast :→ 172.16.127.255

2. Given IP :→ 192.168.100.25
Mask :→ 255.255.255.252

The given IP belongs to class 'c'

252 ⇒ 11111100
hence 6 bits are used for subnet

possible subnet id's are :- $2^6 = 64$

00000000 → 192.168.100.0
00000100 → 192.168.100.4
00001000 → 192.168.100.8
⋮ ⋮
000 11000 → 192.168.100.24
000 11100 → 192.168.100.28

For given IP:- Subnet id :- 192.168.100.24
first add :- 192.168.100.25
last add :- 192.168.100.26
Broadcast :- 192.168.100.27

3. Given IP :- 192.168.100.66/27

27 ⇒ 8 + 8 + 8 + 3
(24 bits used for netid; 3 bits used for subnet)

∴ possible subnets are :- $2^3 = 8$

00000000 → 192.168.100.0
00100000 → 192.168.100.32
01000000 → 192.168.100.64
⋮ ⋮
01100000 → 192.168.100.96
⋮ ⋮

For given Ip :-
Subnet id :- 192.168.100.64
first add. :- 192.168.100.65
last add. :- 192.168.100.94
broad cast add. :- 192.168.100.95

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4. Given Ip address :- 10.73.0.0
Mask :- 255.252.0.0
The IP belong to class 'A'
Binary value of 252 ⇒ 11111100
⇒ 6 bits are used for subnet
∴ possible subnets are :- $2^6 = 64$

00000000 → 10.0.0.0
00000100 → 10.4.0.0
⋮ ⋮
01001000 → 10.72.0.0

For given IP →
Subnet id → 10.72.0.0
first add. → 10.72.0.1
last add. → 10.75.255.254
Broadcast add. → 10.75.255.255

B. Given Ip address :- 172.16.99.99
Mask :- 255.255.192.0
The IP belongs to class 'B'
192 ⇒ 11000000 ⇒ 2 bits are used for subnet
∴ possible subnets are :- $2^2 = 4$

00000000 :- 172.16.0.0
01000000 :- 172.16.64.0
10000000 :- 172.16.128.0
11000000 :- 172.16.192.0

For given IP →
Subnet Id :- 172.16.64.0
first add :- 172.16.64.1
last add :- 172.16.127.254
Broadcast :- 172.16.127.255

c- Network id :- 192.246.35.0
Mask :- 255.255.255.0
We need to divide the network into 5 parts. Hence we will need 3 bits to get network's subnet id.

∴ possible subnets are :-

00000000 → 192.246.35.0
00100000 → 192.246.35.32
01000000 → 192.246.35.64
01100000 → 192.246.35.96
10000000 → 192.246.35.128
10100000 → 192.246.35.160
11000000 → 192.246.35.192
11100000 → 192.246.35.224

① → 3 bits are used for subnetting
② ∴ each subnet support 30 hosts
⇒ total host supported are = 30 x 8 = 240
③ subnet mask is 255.255.255.224
④ first subnet id :- 192.246.35.0
⑤ first valid host in first subnet :- 192.246.35.1
⑥ last valid host in first subnet :- 192.246.35.30
⑦ Broadcast id of first subnet :- 192.246.35.31
⑧ Last subnet id :- 192.246.35.224
⑨ First valid host in last subnet :- 192.246.35.225
⑩ Last valid host in last subnet :- 192.246.35.254
⑪ Broadcast Id of last subnet :- 192.246.35.255