

Q3) IP address 25.34.12.56/16

(4)

255.255.0.0

(a) Calc. of network address

25.34.12.56 ~~0000~~ 00011001. 00100010. 00001100. 00111000  
255.255.0.0 11111111. 11111111. 00000000. 00000000

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25.34.0.0 (X) 00011001. 00100010. 00000000. 00000000  
25.34.0.1 [Mask ANDed]

25.34.255.255 (X) 00011001. 00100010. 11111111. 11111111  
25.34.255.254 [Mask complement  
ORed]

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123.56.77.32/29

Q4  
1(a)

$$\text{Host} = 2^{32-29}$$

$$= 2^3 = 8 \text{ (7 usable)}$$

11111111. 11111111. 11111111. 11110000

host

123.56.77.00100001 → 123.56.77.33  
⋮  
(first)

123.56.77.00100110 → 123.56.77.38  
(last)

1 (b) 180.34.64.64/30

180.34.64.65  $\rightarrow$  first (180.34.64.11111101)

180.34.64.66  $\rightarrow$  last (180.34.64.11111110)

1 (c) 200.17.21.128/27

200.17.21.10000001  $\rightarrow$  200.17.21.129  
(first)

200.17.21.10011110  $\rightarrow$  200.17.21.158  
(last)

————— X —————

2

175.200.0.0

175.200.00000000.00000000

└──────────┬──────────┘

N/w prefix      Host

175.200.00000000.0  $\rightarrow$  175.200.0.0/18

175.200.01000000.0  $\rightarrow$  175.200.64.0/18

175.200.10000000.0  $\rightarrow$  175.200.128.0/18

175.200.11000000.0  $\rightarrow$  175.200.192.0/18

(Q4)

16.0.0.0/8

↳ 500 fixed-length subnets

(1)  $2^9 = 512$ ,

Subnet prefix = /17  
( /8+9)

Subnet mask = 255.255.128.0

(2) Subnet mask is /17

Number of bits for Host:  $32 - 17 = 15$

Each subnet has  $2^{15} = 32,768$  addresses  
(-2)

(3)(a) 1<sup>st</sup> subnet:

1<sup>st</sup> address: 16.0.0.0 (X)

00010000 00000000 00000000 00000000

17 bits

15 bits

(subnet)

(host)

16.0.0.00000001 → 16.0.0.1

last address: 00010000 00000000 01111111 11111111

17 bits

15 bits

(X)

16.0.127.255

(Note: 255 is broadcast)

16.0.01111111.11111110 → 16.0.127.254

(6) ~~4~~

(3)(b) At subnet 500,

N/w address - 16.249.128.0

First - 16.249.128.1  
to

Last - 16.249.255.254

Broadcast - 16.249.255.255



14.24.74.0/24

Allocated no. of addresses

$$2^{32-24} = 2^8 = 256$$

First address:

14.24.74.0/24

Last address: 14.24.74.255/24

Mask = 255.255.255.0

↳ One subblock of 120 addresses

$$2^7 = 128$$

First 14.24.74.0/25 ; Last 14.24.74.127/25

↳ 60 addresses

$$2^6 = 64$$

First 14.24.74.128/26 ; Last 14.24.74.191/26

↳ 10 addresses

$$2^4 = 16$$

First 14.24.74.192/28 ; Last 14.24.74.207/28

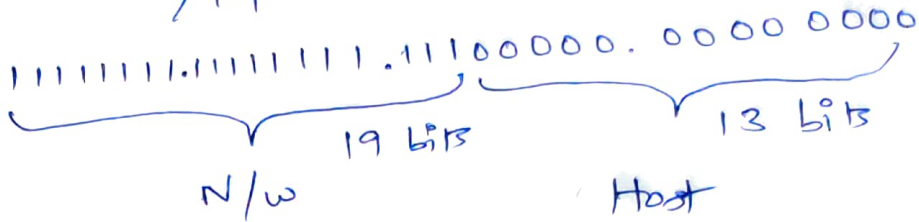
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172.25.171.182

255.255.224.0

↓

/19



All the last 13 bits as '0' → Network address

↳ 172.25.160.0/19

↳ 172.25.191.255/19 → broadcast address