Data communication & networking

Assignment #03

Q No 1) : dotted decimal notation to binary

(a) 114. 34. 2. 8

128 64 32 16 8 4 2 1

B.N = 01110010. 00100010. 00000010. 00001000

(b) 129. 14. 6. 8

B.N. 10000001. 00001110. 00000110. 00001000

(c) 208. 34. 54. 12

B.N 11010000. 00100010. 00110110. 00001100

(d) 238. 34. 2. 1

B.N. 11101110. 00100010. 00000010. 00000001

Q No2)

Sol:

IP of one host is 25.34.12.56/16

25 | 34 | 12 | 56 /16
8 8 8 8 → bits
(net)

network address is 25.34.0.0/16

limited broadcast address is 25.34.255.255/16

Q No3)

(i) Administrator want 500 fixed lenght subnet

Now $2^9 = 512$

we need to add 9 more extra 1s into

$\log_2 500 = 8.96$

The number of extra 1s is 9 and possible subnets is 512

The subnet prefix is then /17

The subnet mask is 255.255.128.0

(ii) The side has 2^{32-8} $= 2^{24} = 16777216$ addresses

Each subnet has 2^{32-17} $= 2^{15} = 32,768$ addresses

(iii) subnet 1 d => 0

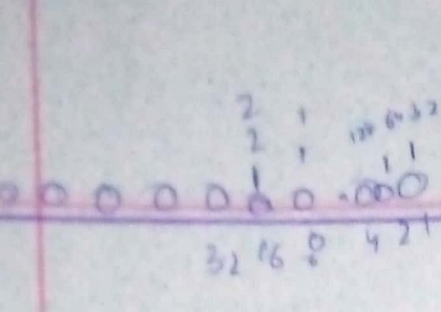
16.0.0.0/17

first address : 16.0.0.0/17

Now we have

$2^{32-17} = 2^{15}$ -> bits $= 32768$

last address. 16.0.127.255/17



(iv) subnet 500 :d=> 499

16.0.0.0/17

16.0.0.0/17

~~16.0.1.~~

first address is = 16.249.128.0/17

last address of 499 is = 16.249.255.255/17

Q No 4)

ISP block addresses starting with
150.80.0.0/16

Total no of addresses available here is

$2^{32-16} = 65536 \Rightarrow 2^{16}$ -> bits

(a) First group has 200 medium size business each need 128 addresses.

$32 - \log_2 128 \rightarrow 2^7$ -> bits

$32 - 7 = 25$

1st business d => 0

first is 150.80.0.0/25

last is 150.80.0.127/25

200th business d => 199

first is 150.80.99.128/25

last is 150.80.99.255/25

Total range = 200 * 128 = 25,600 addresses

(b) second group has 400 business each needs 164 address

$32 - \log_2 N$

$32 - \boxed{\log_2 16} \Rightarrow 2^4$

$32 - 4 = 28$

1st business 150.80.100.0/28

150.80.100.15/28

400 business d -> 394

150.80.24.240/28

150.80.24.255/28

user usage = $400 \times 16 = 5200$