CS & IT ENGINEERING

Computer Networks

IP address Subnetting Supernetting

DPP 01 Discussion Notes

[MCQ]

#Q. An organization is granted the block 150.36.0.0/16. The administrator wants to create 512 subnets.

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What is the subnet mask?

A 255.255.255.128/25

B 255.255.255.192/26

C 255.255.255.224/27

D 255.255.255.240/28

16 bit belong the N/w id.
Host id no of bits = 32-16 = 16 bit.
512 subnet = 2^9 subnets.
we have to borrow 9 bits from host id
After subnetting no of bits for N/w id.
16+9 = 25 bit
25 bits 1 ⇒ 255.255.255.10000000
(8bit 8bit 8bit)
⇒ 255.255.255.128/25.

[MCQ]

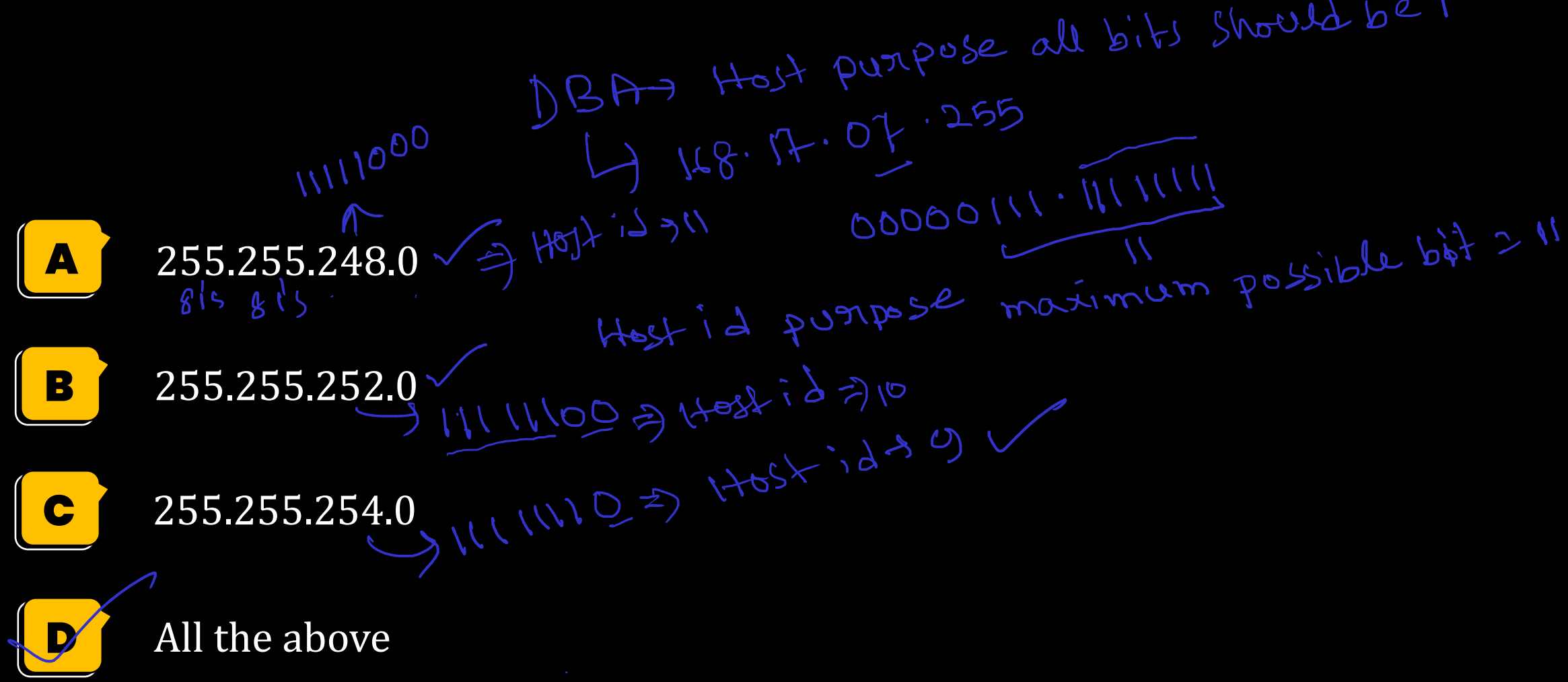
#Q. What could be the network mask if the direct broadcast address of a network is 168.17.07.255?

A. 255.255.248.0

B. 255.255.252.0

C. 255.255.254.0

D. All the above



[MCQ]

#Q. The subnet mask for a particular network is 255.255.252.0. Which of the following pairs of IP addresses could belong to this network?

A) 172.57.88.62
255.255.252.0
N/W: 172.57.88.0

172.57.87.233
255.255.252.0
172.57.84.0

88: 0101 1000
252: 1111 1100
88: 0101 1000

87: 0101 0111
252: 1111 1100
84: 0101 0100

A. 172.57.88.62 and 172.57.87.233

B. 10.35.24.2 and 10.35.29.4

C. 191.203.31.87 and 191.234.31.88

191.203 ~ 191.234

D. 128.8.129.43 and 128.8.131.42

B)

10.35.24.2
255.255.252.0
10.35.24.0

24: 00011000
252: 11111100
24: 00011000

10.35.29.4
255.255.252.0
10.35.28.0

29: 00011101
252: 11111100
28: 00011100

C)

191.203.31.87
255.255.252.0
191.203.28.0

31: 00011111
252: 11111100
28: 00011100

191.234.31.86
255.255.252.0
191.234.28.0

No match

D)

128.8.129.43
255.255.252.0
128.8.128.0

129: 10000001
252: 11111100
128: 10000000

both match

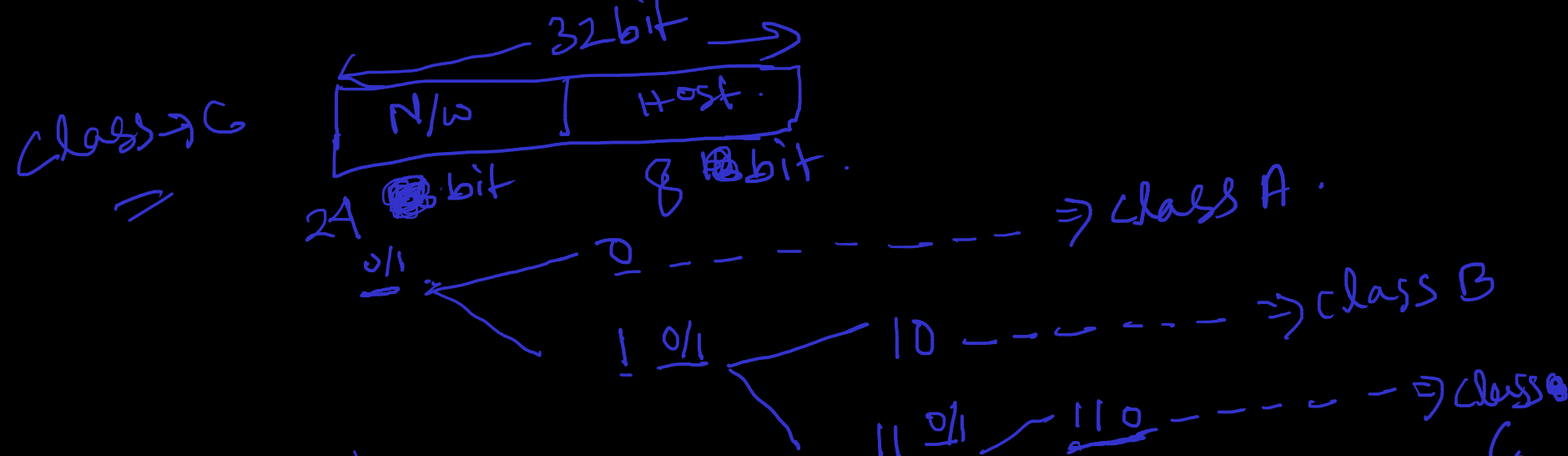
128.8.131.42
255.255.252.0
128.8.128.0

131 ⇒ 10000011
252 ⇒ 11111100
128 ⇒ 10000000

option D correct

[MCQ]

#Q. In IP4 addressing format, the number of networks allowed under Class-C address is:



A 2^{24}

B 2^{21}

C 2^{8}

D 2^{8-2}

[MCQ]

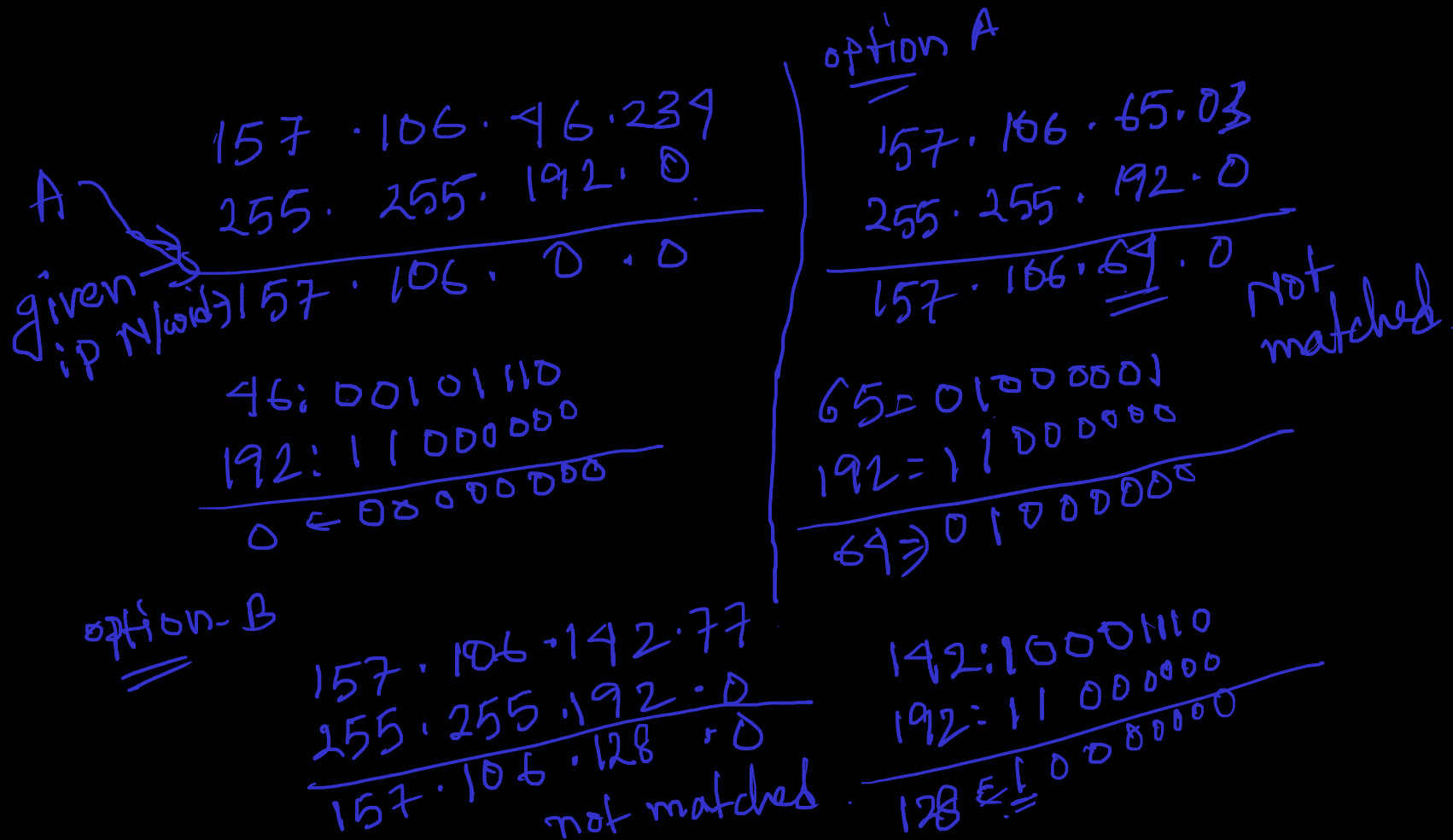
#Q. Suppose a subnet 'X' has a subnet mask 255.255.192.0 and a system A has IP 157.106.46.234. Which of the following IPs belongs to the same network A?

A. 157.106.65.03

B. 157.106.142.77

C. Both (A) and (B)

D. None of these



[MCQ]

#Q. A router uses the following routing table:

Destination	Mask	Interface
144.72.0.0	255.255.0.0	Eth0
144.72.64.0	255.255.224.0	Eth1
144.72.68.0	255.255.255.0	Eth2
144.72.68.64	255.255.255.224	Eth3

matched

A packet bearing a destination address 144.72.68.117 arrives at the router on which interface will it be forwarded?

Eth0
144.72.68.117
255.255.0.0
144.72.0.0
matched

A Eth0

B Eth1

C Eth2

D Eth3

Eth1
149.72.68.117
255.255.224.0
149.72.64.0 ⇒ matched.

68 = 01000100
224 = 11100000
64 = 01000000

Eth2
149.72.68.117
255.255.255.0
149.72.68.0 ⇒ matched.

Eth3
149.72.68.117
255.255.255.224
149.72.68.96

117 ⇒ 01110101
224 ⇒ 11100000
96 = 01100000

Not matched.

*** Eth2 having more no of 1s in net mask thats why Router will select this interface.

[MCQ]

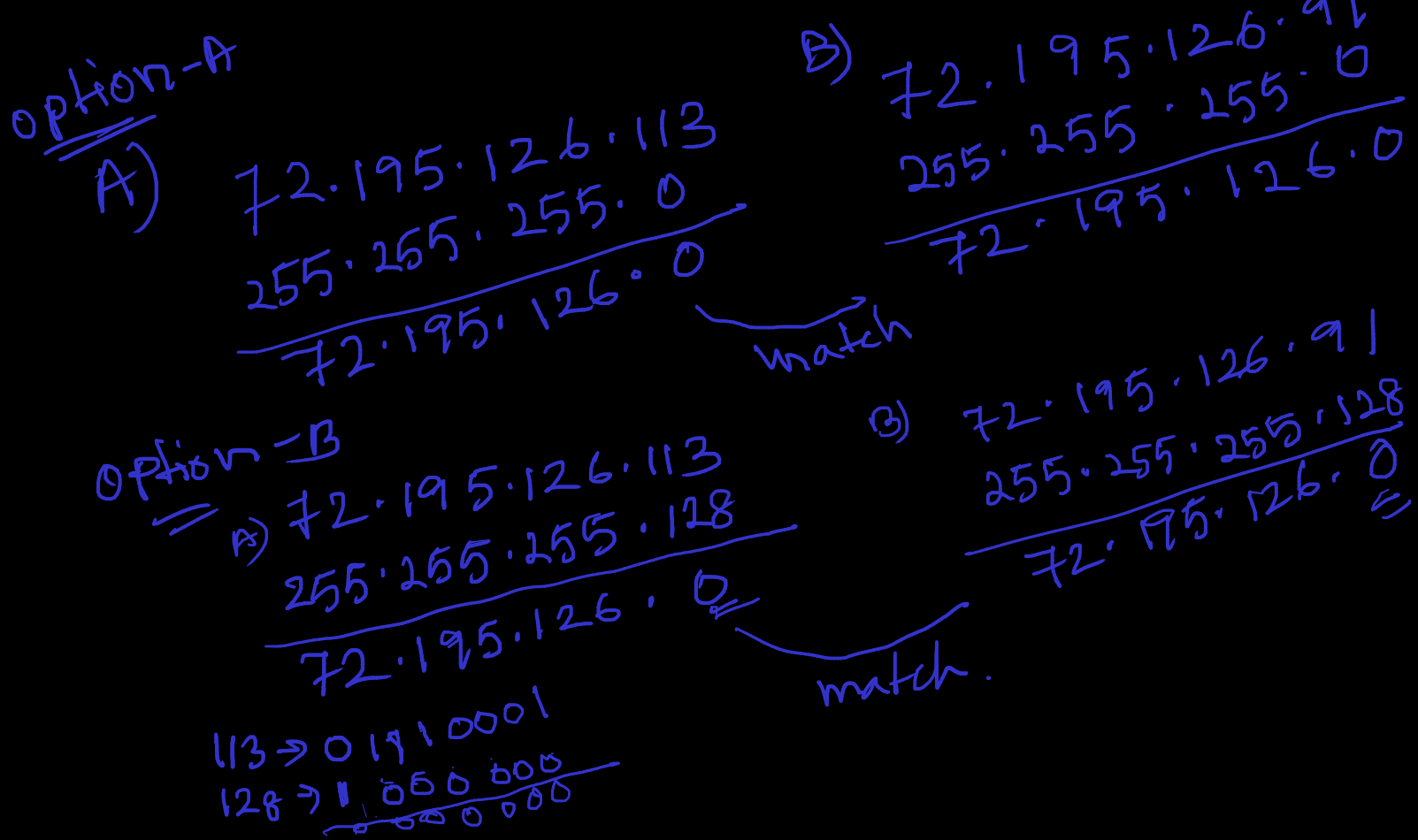
#Q. Let computers A and B have IP addresses 72.195.126.113 and 72.195.126.91, respectively, and both use subnet mask 'N'. Then what is the value of 'N' that should not be used out of the following if both belong to the same network?

A) 255.255.255.0

B) 255.255.255.128

C) 255.255.255.192

D) 255.255.255.224



option C

A → 72.195.126.113
255.255.255.192
72.195.126.64

113: 01110001
192: 11000000
64 ∈ 01000000

B ⇒ 72.195.126.91
255.255.255.192
72.195.126.64

match

91: 01011011
192: 11000000
64 = 01000000

option D

A → 72.195.126.113
255.255.255.224
72.195.126.96

113:- 01110001
224: 11100000
96 ∈ 01100000

B → 72.195.126.91
255.255.255.224
72.195.126.64

not match

91: 01011011
224: 11100000
64 = 01000000

[MCQ]

#Q. 127.0.127.195 is a:

Class-A IP address Range

0 — 127

0.0.0.0 ⇒ DHCP

1 } ⇒ N/W purpose we use

126 }

127.x.y.2 ⇒ Loop back Address

A Limited Broadcast Address

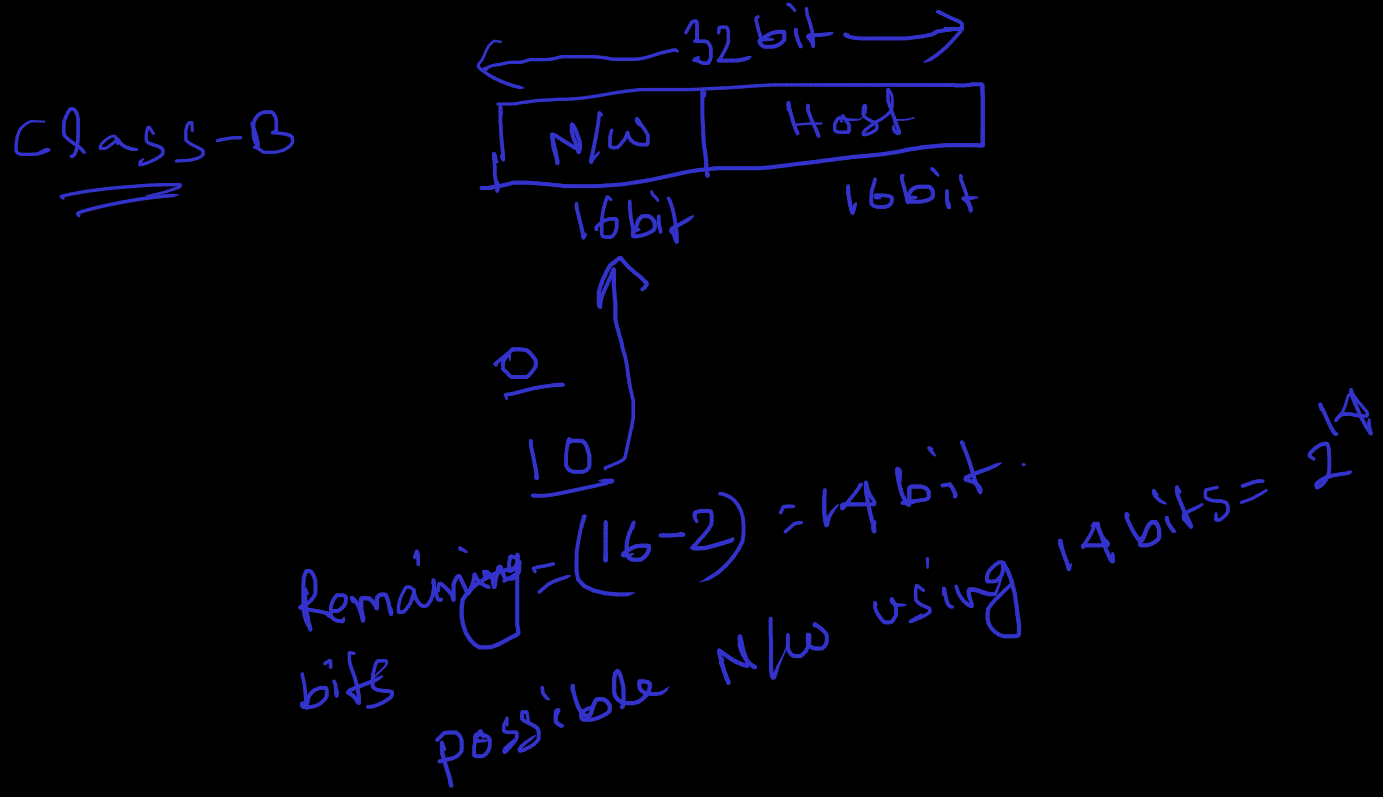
B Direct Broadcast Address

C Multicast Address

D Loopback Address

[MCQ]

#Q. How many networks of class B are possible



A 2^{32}

B 2^{16}

C 2^{14}

D 2^{7}

[MCQ]

#Q. In which of the following strategies, bits from HID are chosen in an IP address. (HID means Host ID).

HID ↓ Host id.

A subnetting ⇒ taking bits from Host id

B supernetting ⇒ taking bits from N/w id.

C NAT →

D None of these

[MCQ]

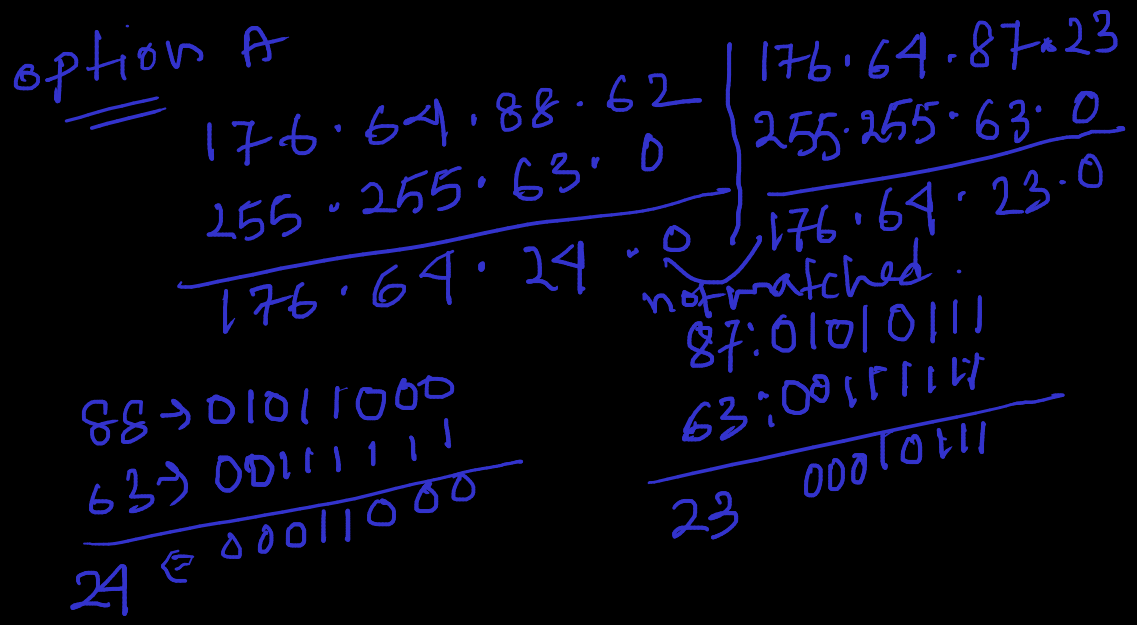
#Q. 255.255.63.0 is the subnet mask for the network. Which of the following pairs of IP addresses could belong to same network?

A. 176.64.88.62 and 176.64.87.23

B. 11.45.28.12 and 11.45.99.24

C. 125.18.130.25 and 125.18.194.46

D. 193.213.31.67 and 193.213.96.89



option B

11.45.28.12
255.255.63.0
11.45.28.0

28: 00011100
63: 00111111
28 00011100

not matched

11.45.99.24
255.255.63.0
11.45.35.0

99: 01100011
63: 00111111
35 = 00100011

option C

125.18.130.25
255.255.63.0
125.18.2.0

130 = 10000010
63 = 00111111
0 = 00000000

matched

125.18.194.46
255.255.63.0
125.18.2.0

194 = 11000010
63 = 00111111
2 = 00000010

option D

193.213.31.67
255.255.63.0
193.213.31.0

31 ⇒ 00011111
63 ⇒ 00111111
31 ⇐ 00011111

not matched

193.213.96.89
255.255.63.0
193.213.64.0

96 ⇒ 01100000
63 ⇒ 00111111
64 ⇐ 01000000

[MCQ]

#Q. You would like to set up an office LAN connected to the Internet via a dedicated router.

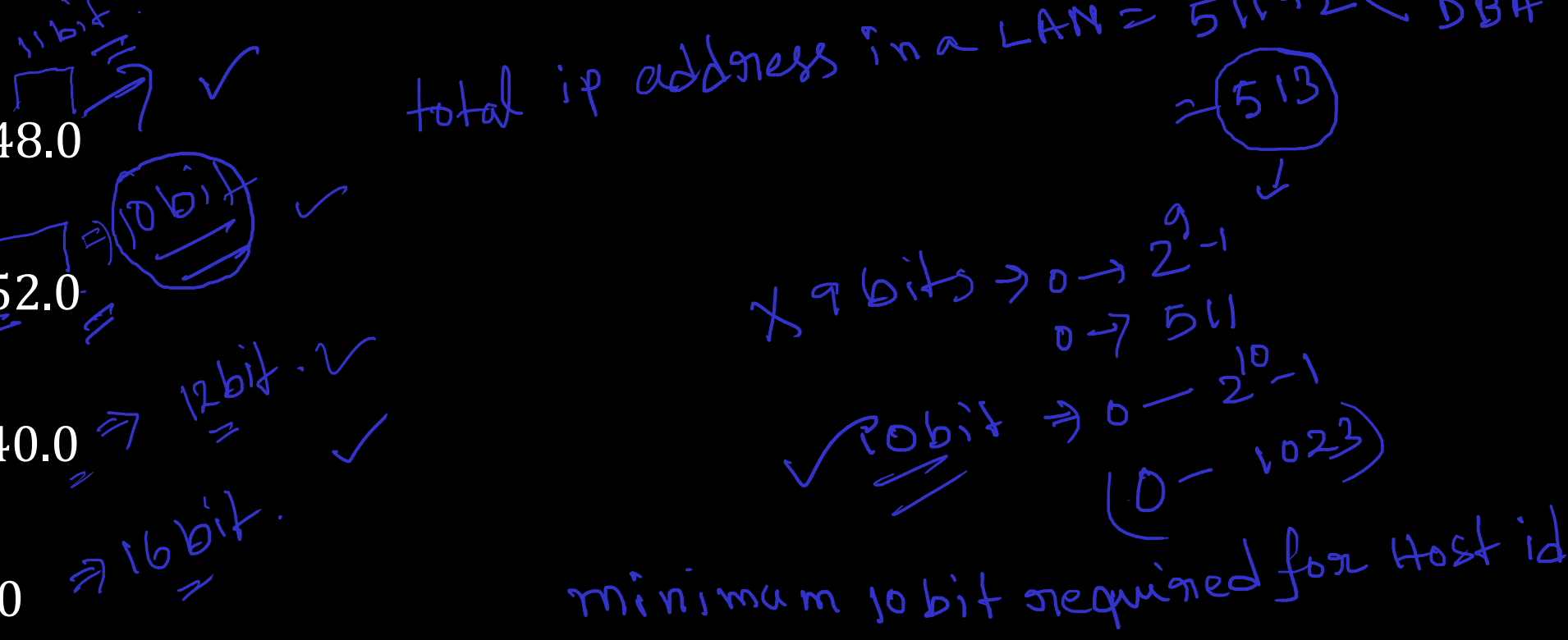
There should be up to 511 hosts with IP addresses connected to the LAN. What is the longest possible netmask for the subnet (the LAN)?

A 255.255.248.0

B 255.255.252.0

C 255.255.240.0

D 255.255.0.0



[MCQ]

#Q. How many subnets and number of hosts per subnet is possible?
For a class B network, which has a subnet mask of 255.255.248.0

Class B → N/w → 16 bit.
Host → 16 bit.
netmask → 255.255.0.0
Subnetmask = 255.255.248.0
8's 8's 5's
11111000
5 bit we borrow from Host id for Subnetting purpose.

A 30, 1024

B 30, 2046

C 32, 2046

D 126, 512

The no of possible subnets $= 2^5 - 2 = 30$

no of Hosts / subnets $= 2^{11} - 2 = 2048 - 2 = 2046$.

[MCQ]

#Q. A router has the following (CIDR) entries in the routing table.

Address/mask	Next hop
138.48.56.0/22	I-0
138.48.60.0/22	I-1
192.150.48.0/23	R-1
default	R-2

Next hop for a packet with IP address 138.48.63.10

I0 mask ⇒ 255.255.252.0

I1 mask ⇒ 255.255.252.0

R1 mask ⇒ 255.255.254.0

R2 Default.

A I-0

B I-1

C R-1

D R-2

I0

138 · 48 · 63 · 10
255 · 255 · 252 · 0
---
138 · 48 · 60 · 0

63 : 00111111
252 : 11 111100
---
60 = 00 111100

not matched.

I1

138 · 48 · 63 · 10
255 · 255 · 252 · 0
---
138 · 48 · 60 · 0

matched.

R1

138 · 48 · 63 · 10
255 · 255 · 254 · 0
---
138 · 48 · 62 · 0

↓ not matched.

63 = 00111111
254 = 11111110
---
62 = 00111110

THANK - YOU