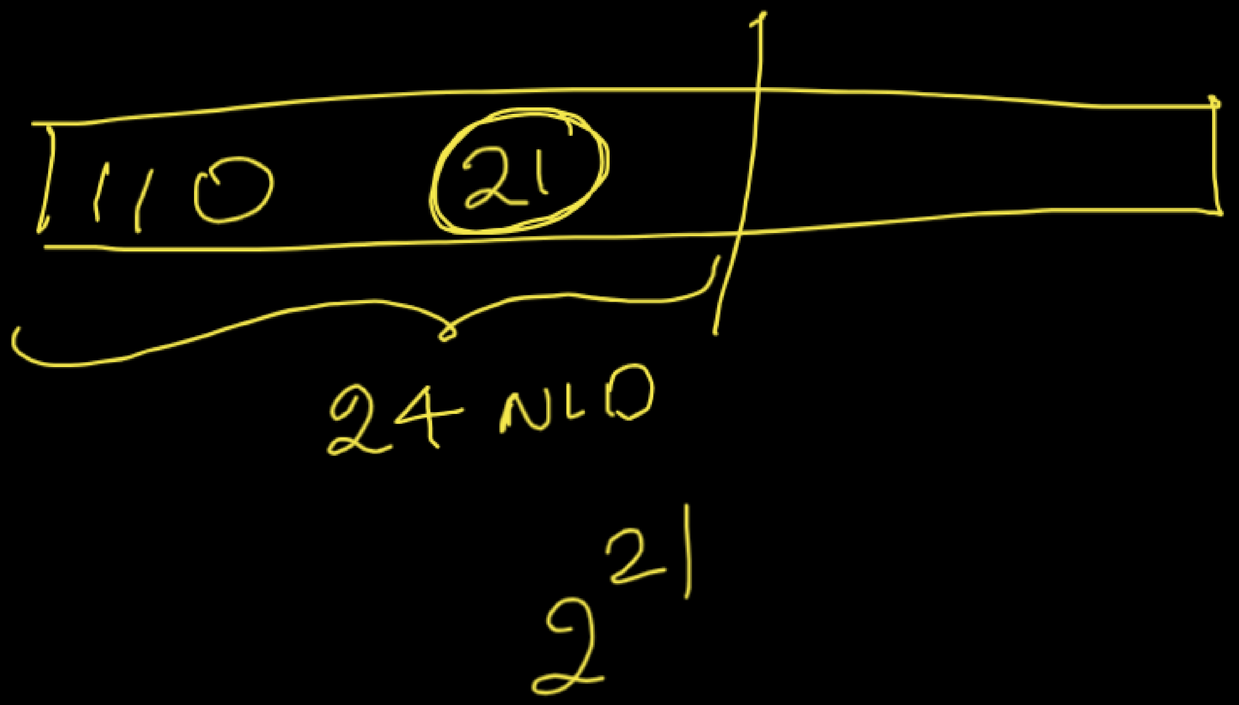
5 min break

8:37

Previous year questions

IP

1. In the IPv4 addressing format, the number of networks allowed under Class C addresses is [2012]



1. In the IPv4 addressing format, the number of networks allowed under Class C addresses is [2012]

(A) 2^{14}
(B) 2^{7}
(C) 2^{21}
(D) 2^{24}

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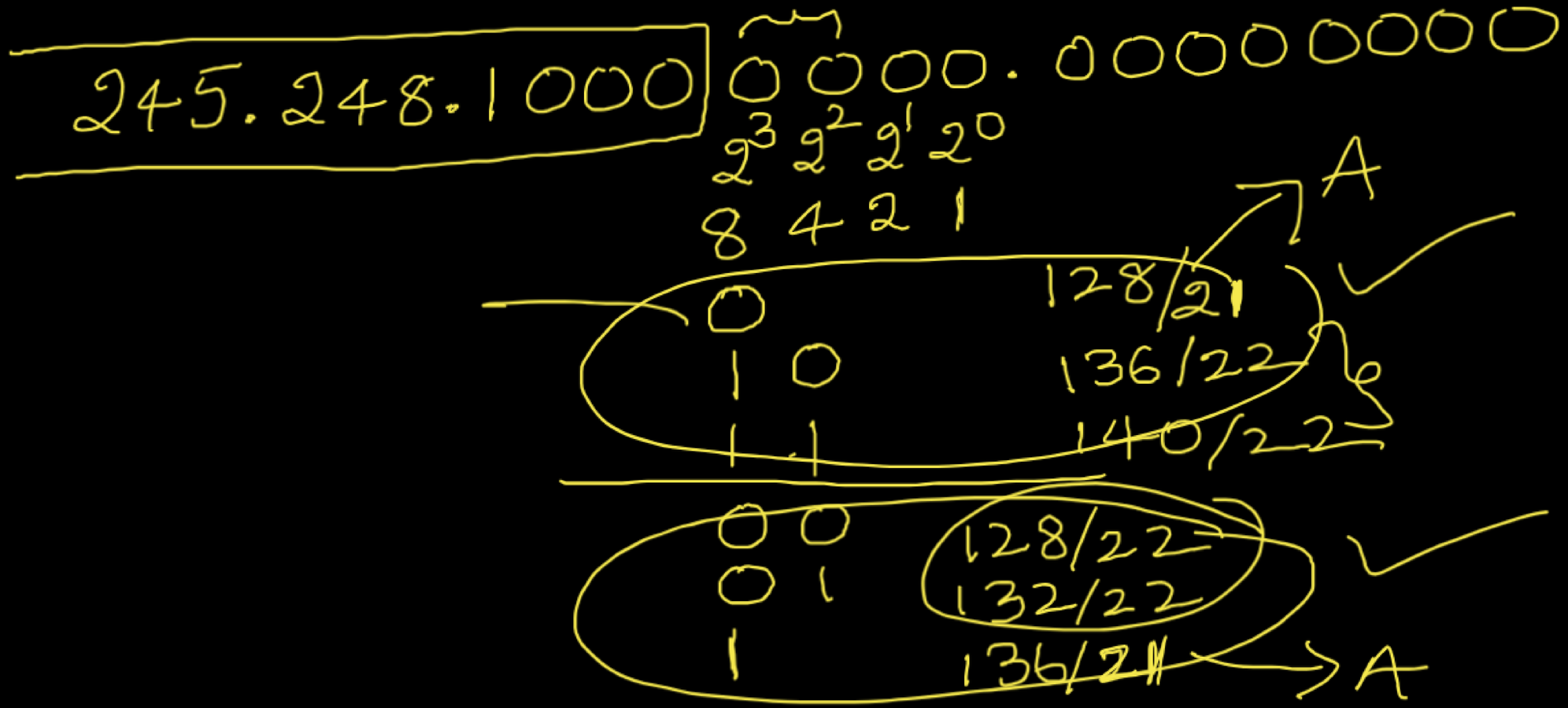
1. In the IPv4 addressing format, the number of networks allowed under Class C addresses is [2012]

(A) 2^{14}
(B) 2^{7}
(C) 2^{21}
(D) 2^{24}

Answer: (C)
Explanation :
For class C address, size of network field is 24 bits. But first 3 bits are fixed as 110; hence total number of networks possible is 2^{21}

2. An Internet Service Provider (ISP) has the following chunk of CIDR-based IP addresses available with it: 245.248.128.0/20. The ISP wants to give half of this chunk of addresses to Organization A, and a quarter to Organization B, while retaining the remaining with itself.



2. An Internet Service Provider (ISP) has the following chunk of CIDR-based IP addresses available with it: 245.248.128.0/20. The ISP wants to give half of this chunk of addresses to Organization A, and a quarter to Organization B, while retaining the remaining with itself.
Which of the following is a valid allocation of addresses to A and B? [2012]

(A) 245.248.136.0/21 and 245.248.128.0/22
(B) 245.248.128.0/21 and 245.248.128.0/22
(C) 245.248.132.0/22 and 245.248.132.0/21
(D) 245.248.136.0/24 and 245.248.132.0/21

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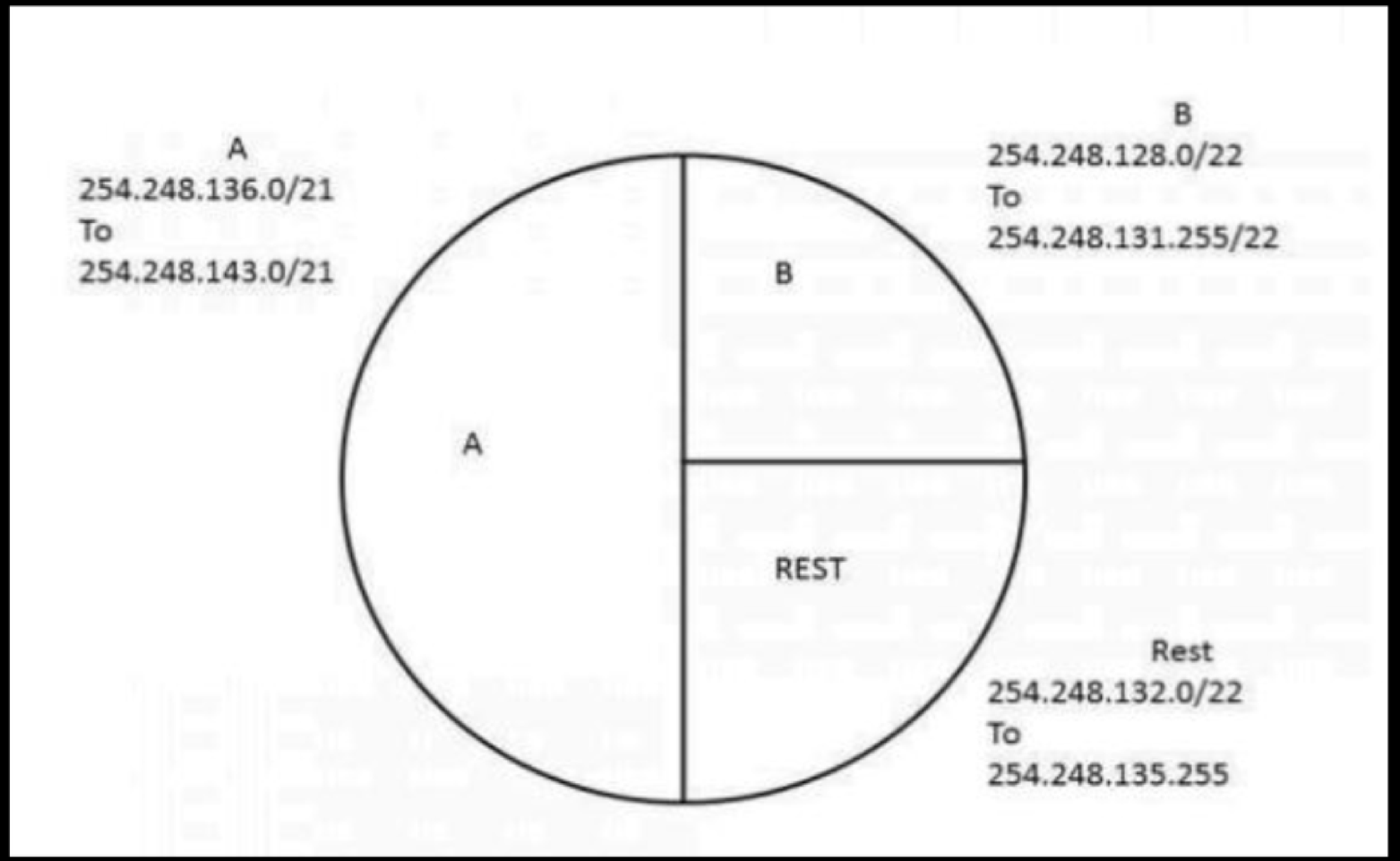
Which of the following is a valid allocation of addresses to A and B? [2012]

(A) 245.248.136.0/21 and 245.248.128.0/22
(B) 245.248.128.0/21 and 245.248.128.0/22
(C) 245.248.132.0/22 and 245.248.132.0/21
(D) 245.248.136.0/24 and 245.248.132.0/21

Answer: (A)

Explanation :



3. An IP router implementing Classless Inter-domain Routing (CIDR) receives a packet with address 131.23.151.76. The router's routing table has the following entries: [2014]

Prefix	Output Interface Identifier
131.16.0.0/12	3
131.28.0.0/14	5
131.19.0.0/16	2
131.22.0.0/15	1

The identifier of the output interface on which this packet will bforwarded is _____.

Routing table

SID	Sm	Interface
131.16.0.0	255.240.0.0	

3. An IP router implementing Classless Inter-domain Routing (CIDR) receives a packet with address 131.23.151.76. The router's routing table has the following entries: [2014]

Prefix	Output Interface Identifier
131.16.0.0/12	3
131.28.0.0/14	5
131.19.0.0/16	2
131.22.0.0/15	1

The identifier of the output interface on which this packet will bforwarded is _____.

Answer: (1)

Explanation:

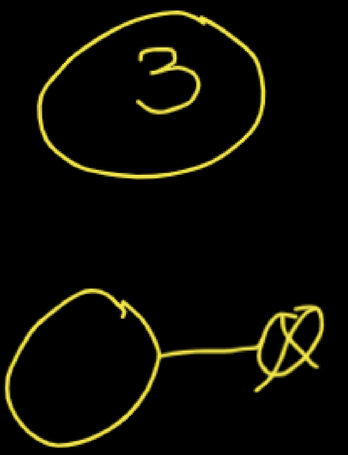
Let take, 131.22.0.0/15 Its Net Mask is 255.254.0.0.

If we do AND operation between 255.254.0.0 and given IP 131.23.151.76, gives 131.22.0.0 which is matching with interface 1.

4. Consider three machines M, N and P with IP addresses 100.10.5.2, 100.10.5.5 and 100.10.5.6, respectively. The subnet mask is set to 255.255.255.252 for all three machines.

Which one of the following is true? [2019]

(a) M, N and P all belong to the same subnet
(b) Only N and P belong to the same subnet
(c) M, N, and P belong to three different subnets
(d) Only M and N belong to the same subnet



255.255.255.11111100 → 1+1+0=2

2^2 = 4 IP

NID HA

2 hosts

Take each IP and do bitwise AND with the given Subnet Mask. If we get the same network ID for the given IPs, they will belong to the same subnet.

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IP's	Subnet Mask	=>	NID
M: 100.10.5.00000010	255.255.255.11111100		100.10.5.0
N: 100.10.5.00000101	AND 255.255.255.11111100		100.10.5.4
P: 100.10.5.00000110	255.255.255.11111100		100.10.5.4

Take each IP and do bitwise AND with the given Subnet Mask. If we get the same network ID for the given IPs, they will belong to the same subnet.

IP's	Subnet Mask	=>	NID
M: 100.10.5.00000010	255.255.255.11111100		100.10.5.0
N: 100.10.5.00000101	AND 255.255.255.11111100		100.10.5.4
P: 100.10.5.00000110	255.255.255.11111100		100.10.5.4

Therefore, N and P belong to the same subnet.

5. An organization is granted the block 150.36.0.0/16. The administrator wants to create 512 subnets. What is the subnet mask?

/16

NID = 16

HID =

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

512 → 2^9 = 9 = SID.

NID = 16
SID = 9
= 25

SM → 25 1s

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

Answer: Option A

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

Answer: Option A

Explanation:

From the Question, 16 bits are for the NID part and 16 bits are for the HID part. We need to create 512 subnets. So we require 9 bits to be borrowed from HID i.e., 8 bits from the 3rd octet and 1 bit from the 4th octet.

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(C) 255.255.255.224/27 (D) 255.255.255.240/28

Answer: Option A

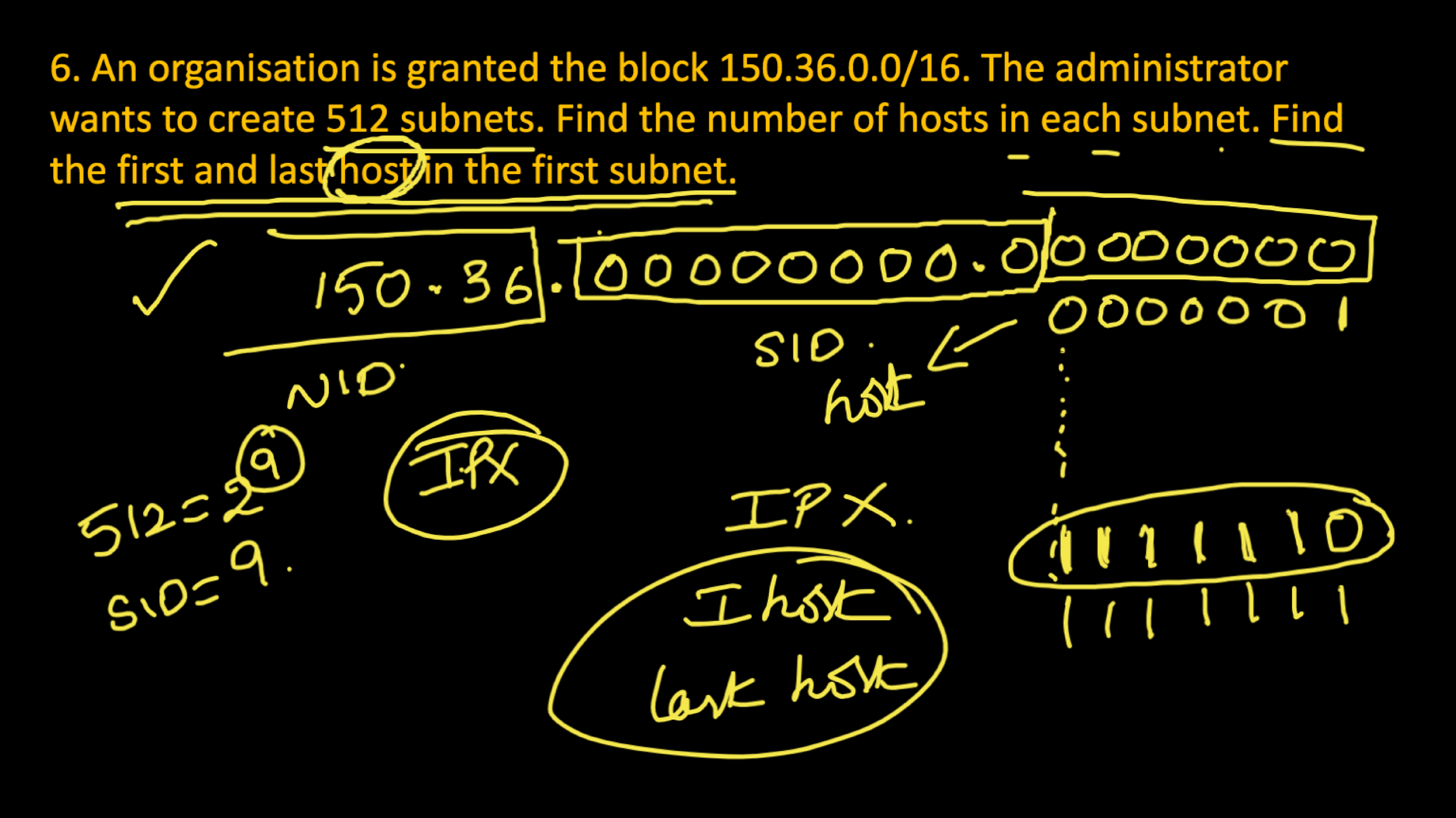
Explanation:

From the Question, 16 bits are for the NID part and 16 bits are for the HID part. We need to create 512 subnets. So we require 9 bits to be borrowed from HID i.e., 8 bits from the 3rd octet and 1 bit from the 4th octet.

Therefore, the total number of 1's in subnet mask will be 16 (because of network id part) + 9 (because of subnet part) = 25

Hence the subnet mask will 255.255.255.128/25

6. An organisation is granted the block 150.36.0.0/16. The administrator wants to create 512 subnets. Find the number of hosts in each subnet. Find the first and last host in the first subnet.



6. An organisation is granted the block 150.36.0.0/16. The administrator wants to create 512 subnets. Find the number of hosts in each subnet. Find the first and last host in the first subnet.

(A) 128, 150.36.0.1 and 150.36.0.127 (B) 128, 150.36.0.129 and 150.36.0.255

(C) 126, 150.36.0.1 and 150.36.0.126 (D) 126, 150.36.0.129 and 150.36.0.254.

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(A) 128, 150.36.0.1 and 150.36.0.127 (B) 128, 150.36.0.129 and 150.36.0.255
(C) 126, 150.36.0.1 and 150.36.0.126 (D) 126, 150.36.0.129 and 150.36.0.254.

Answer: Option C

.

6. An organisation is granted the block 150.36.0.0/16. The administrator wants to create 512 subnets. Find the number of hosts in each subnet. Find the first and last host in the first subnet.
(A) 128, 150.36.0.1 and 150.36.0.127 (B) 128, 150.36.0.129 and 150.36.0.255
(C) 126, 150.36.0.1 and 150.36.0.126 (D) 126, 150.36.0.129 and 150.36.0.254.

Answer: Option C

Explanation:
Given 150.36.0.0/16 and we need to create 512 subnets. So we require 9 bits to be borrowed from host id and we are left with 7 bits in host part. So, practically we have $2^7 - 2 = 126$ hosts per subnet.

The first subnet is 150.36.0.0. So the first host in subnet 1 is 150.36.0.1 and the last host is 150.36.0.126.

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

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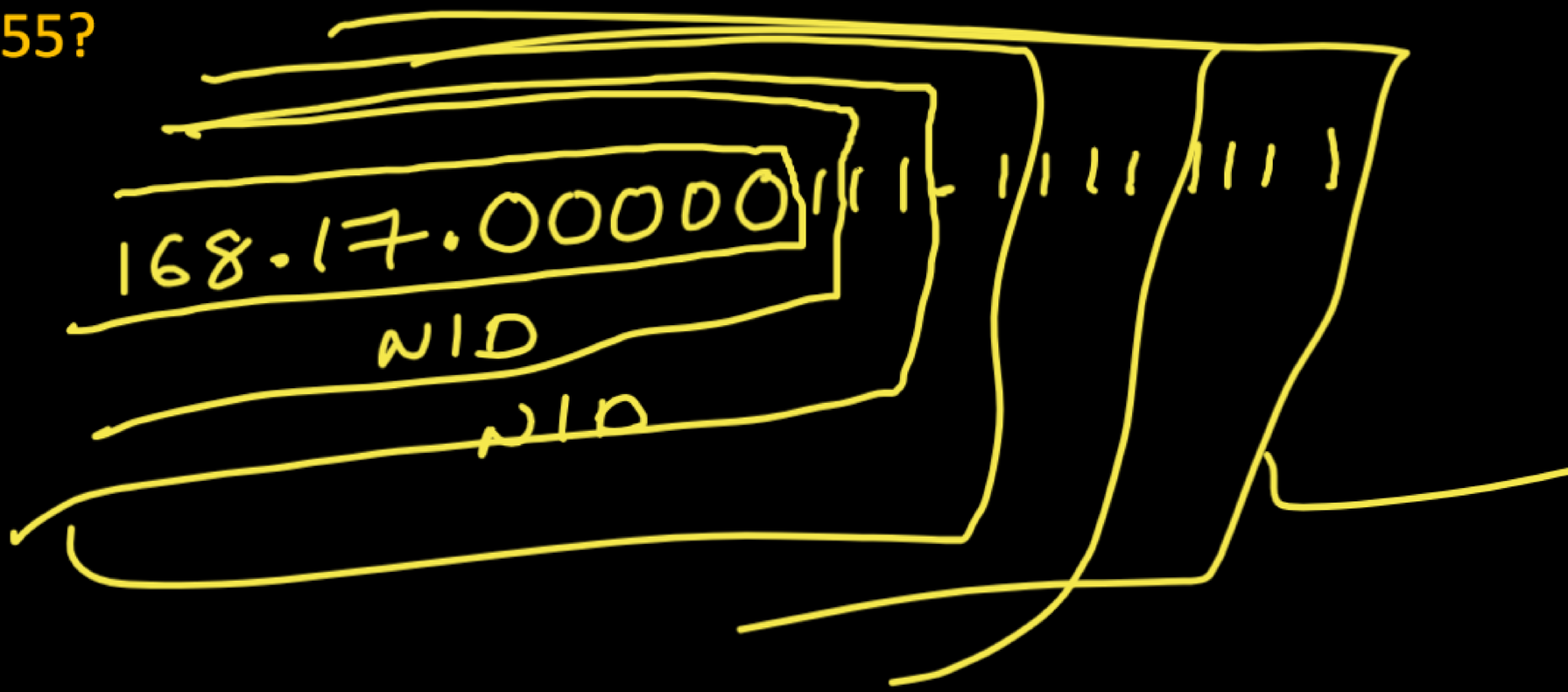
(A) 255.255.248.0
(B) 255.255.252.0
(C) 255.255.254.0
(D) All the above



7. 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

Answer: Option D

Explanation:

Given IP address 168.17.07.255 is DBA and its class B.
In DBA HID part is all 1's
Therefore, 168.17.00000111.11111111
NID HID

Explanation:

Given IP address 168.17.07.255 is DBA and its class B.
In DBA HID part is all 1's
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For Netmask, NID part is all 1's and HID part is all 0's

Since the number of bits in NID or HID is not given, we can take any length for NID.

Explanation:

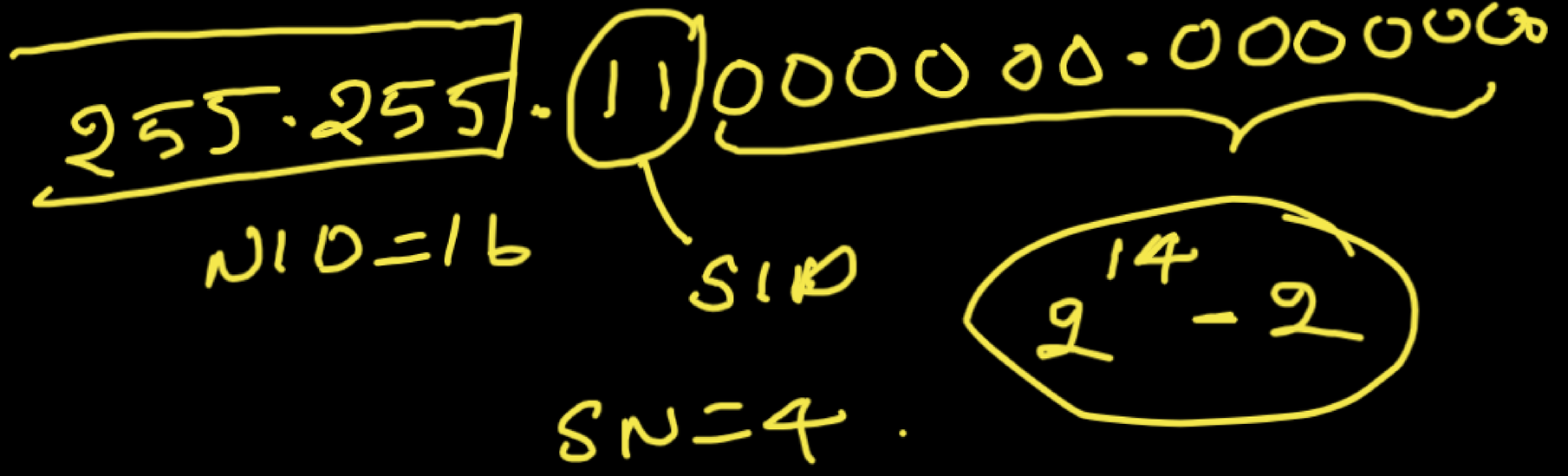
Given IP address 168.17.07.255 is DBA and its class B.
In DBA HID part is all 1's
Therefore, 168.17.00000111.11111111
NID HID
For Netmask, NID part is all 1's and HID part is all 0's

Since the number of bits in NID or HID is not given, we can take any length for NID.
So last 11 bits can be HID (bcz DBA contains all 1's in HID).
Similarly last 10 bits can be HID, or 9 bits or 8 bits.
Depending on the number of bits Subnet Mask will vary.
The range of Netmask can be 255.255.248.0 to 255.255.255.0

8. If a class B network is divided into subnets, and the subnet mask is 255.255.192.0, then how many subnets and hosts per subnet are possible?

8. If a class B network is divided into subnets, and the subnet mask is 255.255.192.0, then how many subnets and hosts per subnet are possible?

(A) 4, 2^{14} - 2
(B) 4, 16
(C) 16, 16
(D) 4, 2^{14}



8. If a class B network is divided into subnets, and the subnet mask is 255.255.192.0, then how many subnets and hosts per subnet are possible?

(A) 4, 2^{14}- 2
(B) 4, 16
(C) 16, 16
(D) 4, 2^{14}

Answer: Option A

Explanation:

Number of 1's= NID + SID
In class B, NID = 16
255.255.192.0= 11111111.11111111.11000000.00000000
∴ 1's = 18
18 = NID + SID
=> 16+ SID =18 => SID= 2
∴ Number of subnets= $2^2 = 4$
Number of 0's in SM indicates HID part.
In the SM given, number of 0's = 14
∴ Hosts per subnet= $2^{14}- 2$

9. 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

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

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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

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

(a) Eth0
(b) Eth1
(c) Eth2
(d) Eth3

All 3 match
So take 3rd

Solution: Option C

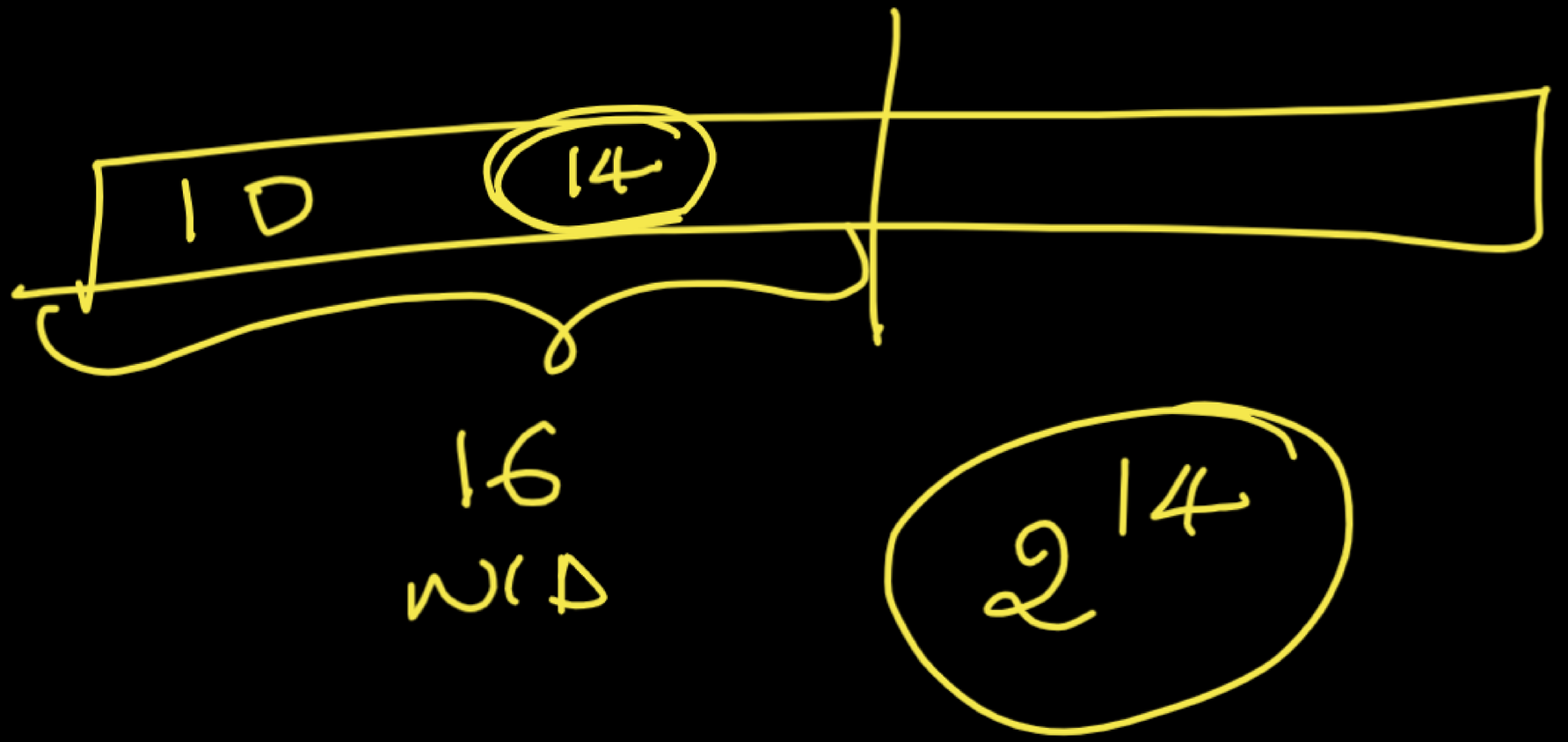
Solution: Option C

Explanation:

Do Bitwise ANDING with the given IP address and each Mask from the table. Results match with destination IP that will be correct interface.

if its match with more than one destination IP then takes highest no. of 1's present in Mask interface.

10. How many networks of class B are possible



10. How many networks of class B are possible

(A) 2^{32}

(B) 2^{16}

(C) 2^{14}

(D) 2^{7}

10. How many networks of class B are possible

(A) 2^{32}

(B) 2^{16}

(C) 2^{14}

(D) 2^{7}

Answer: Option B

10. How many networks of class B are possible

(A) 2^{32}

(B) 2^{16}

(C) 2^{14}

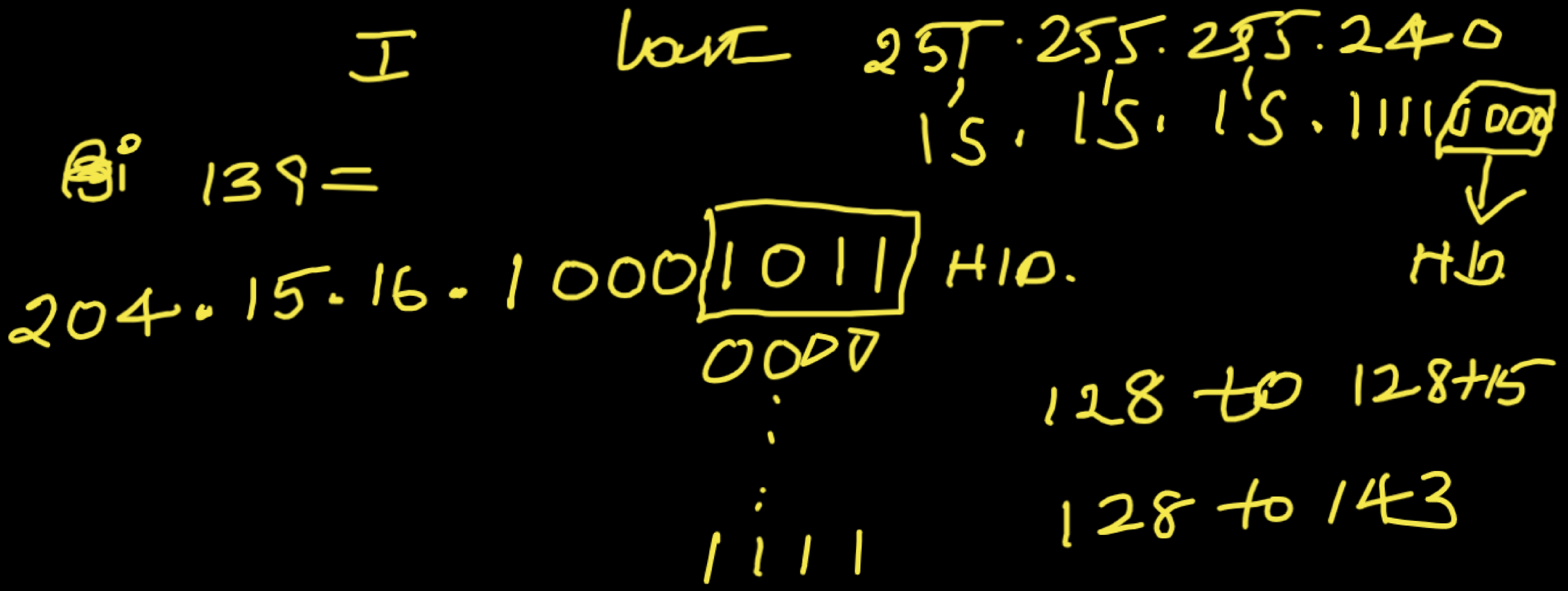
(D) 2^{7}

Answer: Option B

Explanation:

In class B, 16 bits are chosen for network ID and from these 16 bits, 2 leading bits are fixed i.e. “10”, so 14 bits are remaining to used for Host.

11. If IP=204.15.16.139 and subnet mask=255.255.255.240 is given, find out : Subnet address (SID) and Direct broadcast address (DBA) of that subnet



11. If IP=204.15.16.139 and subnet mask=255.255.255.240 is given, find out : Subnet address (SID) and Direct broadcast address (DBA) of that subnet

(A)SID : 204.15.16.192, DBA 204.15.16.255
(B) SID : 204.15.16.128, DBA : 204.15.16.254
(C)SID : 204.15.16.128, DBA : 204.15.16.143
(D)SID : 204.15.16.192, DBA : 204.15.16.254

11. If IP=204.15.16.139 and subnet mask=255.255.255.240 is given, find out : Subnet address (SID) and Direct broadcast address (DBA) of that subnet

(A)SID : 204.15.16.192, DBA 204.15.16.255
(B) SID : 204.15.16.128, DBA : 204.15.16.254
(C)SID : 204.15.16.128, DBA : 204.15.16.143
(D)SID : 204.15.16.192, DBA : 204.15.16.254

Answer : Option (C)

Explanation :

To find the Subnet ID, we have to do bitwise AND with IP and Subnet Mask.

SM: 11111111.11111111.11111111.11110000
IP : 11001100.00001111.00010000.10001011
……
SID: 11001100.00001111.00010000.10000000

Explanation :

To find the Subnet ID, we have to do bitwise AND with IP and Subnet Mask.

SM: 11111111.11111111.11111111.11110000
IP : 11001100.00001111.00010000.10001011
……
SID: 11001100.00001111.00010000.10000000

From the given Subnet Mask we can see that first 28 bits are NID and remaining 4 bits are HID part. And for DBA, all HID part should be 1's.

So DBA is 11001100.00001111.00010000.10001111
DBA of the subnet: 204.15.16.143

12. Match A with B

List A			List B
	Source IP	Destination IP	
a. Data	240.255.255.255	40.40.40.40	1.Unicast packet with in network.
b. Data	22.21.23.34	255.255.255.255	2. This packet will never exist
c. Data	24.23.22.21	24.22.23.24	3. Limited broadcast address.

12. Match A with B

List A	Source IP	Destination IP	List B
a. Data	240.255.255.255	40.40.40.40	1.Unicast packet with in network.
b. Data	22.21.23.34	255.255.255.255	2. This packet will never exist
c. Data	24.23.22.21	24.22.23.24	3. Limited broadcast address.

	a	b	c
(A)	1	2	3
(B)	2	3	1
(C)	1	3	2
(D)	2	1	3

a - 2

b - 3

c - 1

Answer: Option B

Answer: Option B

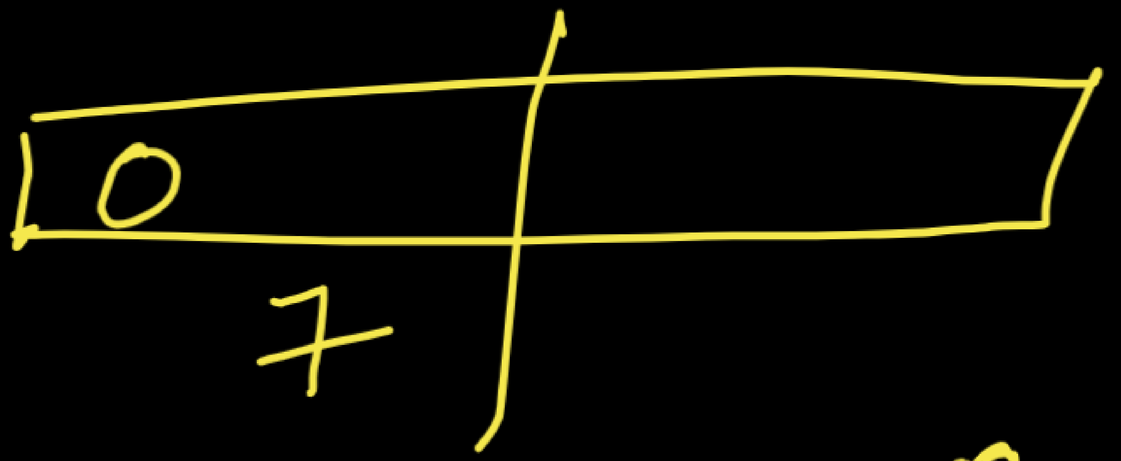
Explanation:

Data | sender address | destination address
a - 2 (we can not use DBA in sender address)
b - 3 (Limited broadcast address 255.255.255.255)
c - 1 (unicast Packet within the network)
A is class E address... So these address are reserved... And we don't practically use them.

13. The number of networks allowed under class A address in IPv4 addressing format is _____.

13. The number of networks allowed under class A address in IPv4 addressing format is _____.

A. 127 B. 128 C. 126 D. 125



$2^7 = 128 < 0$

127

126

13. The number of networks allowed under class A address in IPv4 addressing format is _____.

A. 127 B. 128 C. 126 D. 125

Answer: Option C

13. The number of networks allowed under class A address in IPv4 addressing format is _____.

A. 127 B. 128 C. 126 D. 125

Answer: Option C

Explanation:

In class A 8 network bits.

127 · X · Y · Z and 0 · X · Y · Z can't be used up network address and 1 bit is used to identify the class

$2^7 - 2 = 128 - 2 = 126$ networks allowed.

Here 2 is subtracted from number of networks because they are reserved for special purpose.

14. A company has a Class-C address of 204.204.204.0. It wishes to have three subnets, one with 100 hosts and two with 50 hosts each. Which one of the following options represents a feasible set of subnet mask/ subnet address pairs? [Gate2004]

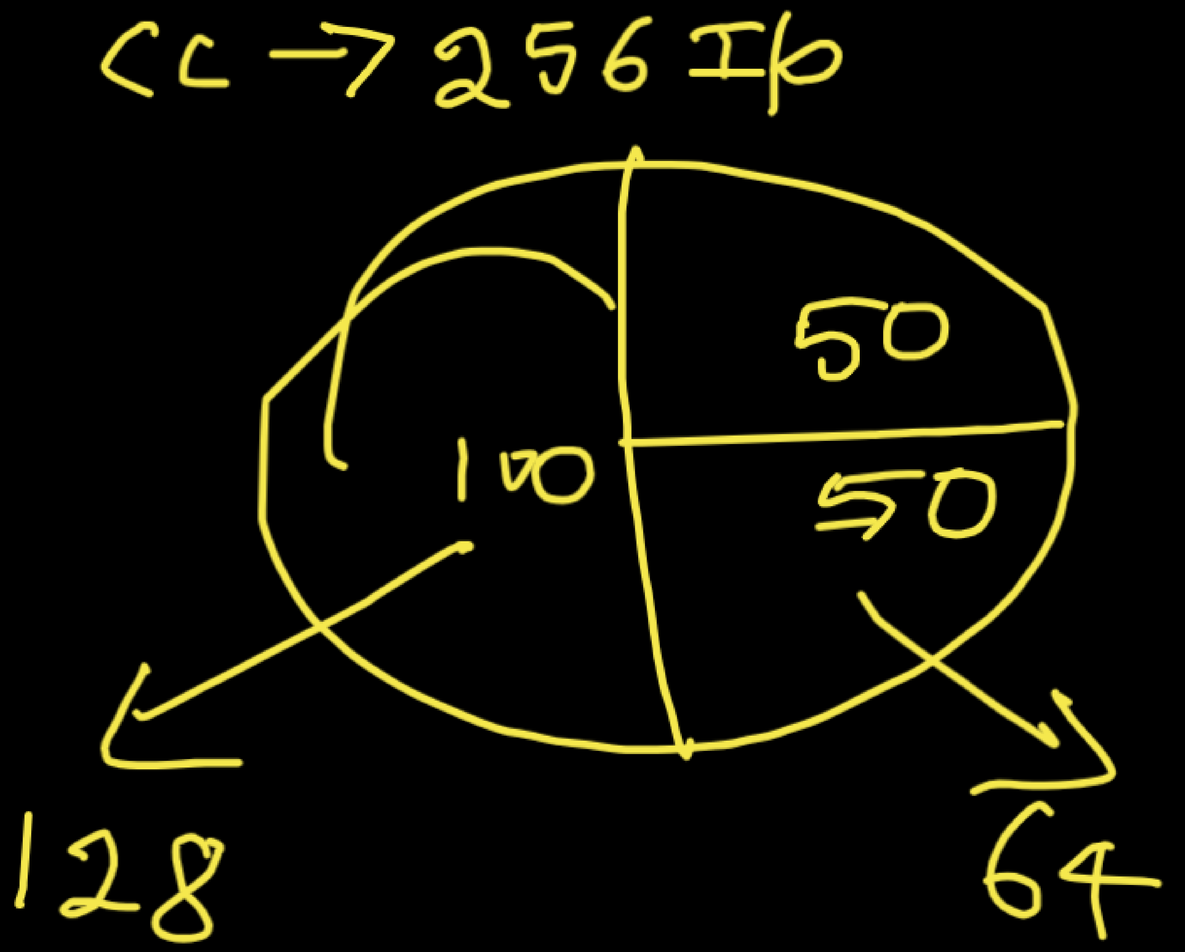
14. A company has a Class-C address of 204.204.204.0. It wishes to have three subnets, one with 100 hosts and two with 50 hosts each. Which one of the following options represents a feasible set of subnet mask/ subnet address pairs? [Gate2004]

(A) 255.255.255.192/ 204.204.204.128
255.255.255.128/ 204.204.204.0
255.255.255.128/ 204.204.204.64

(B) 255.255.255.192/ 204.204.204.0
255.255.255.128/ 204.204.204.192
255.255.255.128/ 204.204.204.64

(C) 255.255.255.128/ 204.204.204.128
255.255.255.192/ 204.204.204.192
255.255.255.192/ 204.204.204.224

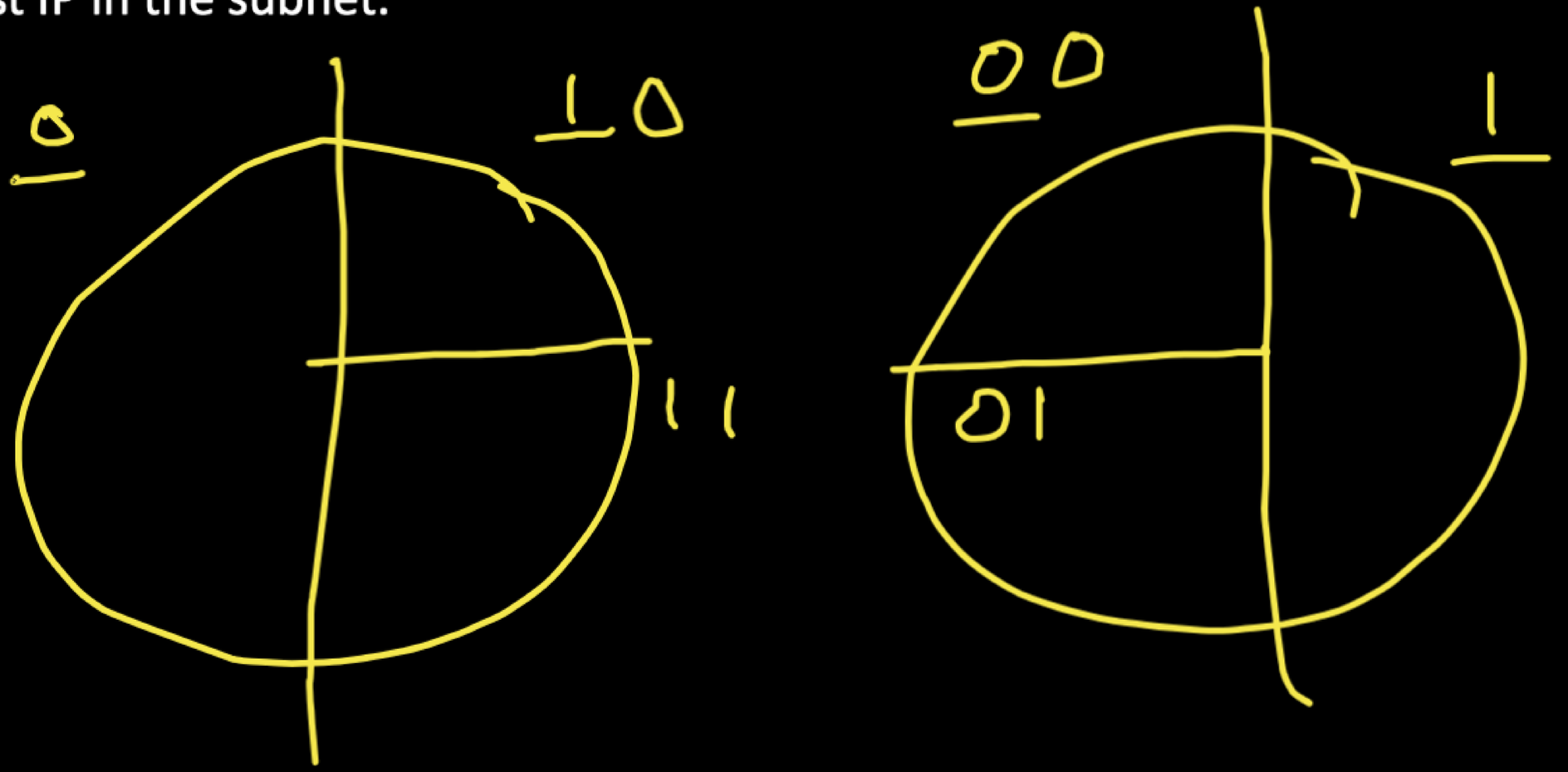
(D) 255.255.255.128/ 204.204.204.128
255.255.255.192/ 204.204.204.64
255.255.255.192/ 204.204.204.0



Answer: Option D

Answer: Option D

Explanation:
Subnet Address: First IP in the subnet.
Subnet Mask: all the net bits + subnet bits will be 1 and host bits will be 0.
DBA: Last IP in the subnet.



Answer: Option D

Explanation:
Subnet Address: First IP in the subnet.
Subnet Mask: all the net bits + subnet bits will be 1 and host bits will be 0.
DBA: Last IP in the subnet.
For class C subnet mask is 255.255.255.0
As its class C address, we have to take two bit from the last octet.

Answer: Option D

Explanation:
Subnet Address: First IP in the subnet.
Subnet Mask: all the net bits + subnet bits will be 1 and host bits will be 0.
DBA: Last IP in the subnet.
For class C subnet mask is 255.255.255.0
As its class C address, we have to take two bit from the last octet.
Therefore, Possible subnet bits would be 00,01,10,11
Subnet address of (100 hosts) = 255.255.255.128
Subnet address of (50 hosts) = 255.255.255.192
Subnet address of (50 hosts) = 255.255.255.192

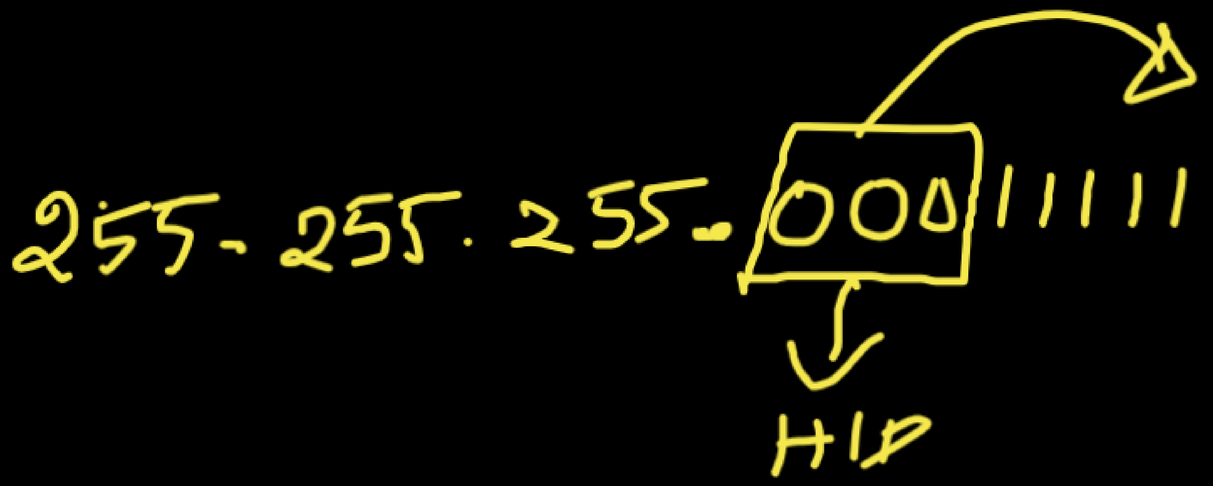
Answer: Option D

Explanation:
Subnet Address: First IP in the subnet.
Subnet Mask: all the net bits + subnet bits will be 1 and host bits will be 0.
DBA: Last IP in the subnet.
For class C subnet mask is 255.255.255.0
As its class C address, we have to take two bit from the last octet.
Therefore, Possible subnet bits would be 00,01,10,11
Subnet address of (100 hosts) = 255.255.255.128
Subnet address of (50 hosts) = 255.255.255.192
Subnet address of (50 hosts) = 255.255.255.192
MSB in last 8 bits helps us to get two subnets
10000000 →→ subnet1
00000000 →→ subnet2
subnet2 is divided into 2 more subnets using 7th bit
00000000 →→ subnet2(0)
01000000 →→ subnet2(1)

15. The subnet mask for a particular network is 255.255.31.0. Which of the following pairs of IP addresses could belong to this network? [Gate2003]

15. The subnet mask for a particular network is 255.255.31.0. Which of the following pairs of IP addresses could belong to this network? [Gate2003]

(A) 172.57.88.62 and 172.56.87.233
(B) 10.35.28.2 and 10.35.29.4
(C) 191.203.31.87 and 191.234.31.88
(D) 128.8.129.43 and 128.8.161.55



15. The subnet mask for a particular network is 255.255.31.0. Which of the following pairs of IP addresses could belong to this network? [Gate2003]

(A) 172.57.88.62 and 172.56.87.233
(B) 10.35.28.2 and 10.35.29.4
(C) 191.203.31.87 and 191.234.31.88
(D) 128.8.129.43 and 128.8.161.55

Answer: Option D

15. The subnet mask for a particular network is 255.255.31.0. Which of the following pairs of IP addresses could belong to this network? [Gate2003]

(A) 172.57.88.62 and 172.56.87.233
(B) 10.35.28.2 and 10.35.29.4
(C) 191.203.31.87 and 191.234.31.88
(D) 128.8.129.43 and 128.8.161.55

Answer: Option D

Explanation:
To find whether hosts belong to sane network or not , we have to find their net id, if net id is same then hosts belong to same network and net id can be find by ANDing subnet mask and IP address.

16. An organization has a class B network and wishes to form subnets for 64 departments. The subnet mask would be: [Gate2005]

16. An organization has a class B network and wishes to form subnets for 64 departments. The subnet mask would be: [Gate2005]

(a) 255.255.0.0
(b) 255.255.64.0
(c) 255.255.128.0
(d) 255.255.252.0

$2^6 =$

SID = 6 bits

NID = 16

SM = 16 + 6 = 22

16. An organization has a class B network and wishes to form subnets for 64 departments. The subnet mask would be: [Gate2005]

(a) 255.255.0.0
(b) 255.255.64.0
(c) 255.255.128.0
(d) 255.255.252.0

Ans. d

16. An organization has a class B network and wishes to form subnets for 64 departments. The subnet mask would be: [Gate2005]

(a) 255.255.0.0
(b) 255.255.64.0
(c) 255.255.128.0
(d) 255.255.252.0

Ans. d

Explanation: The organization have 64 departments, and to assign 64 subnet we need 6 bits for subnet. In Class B network first two octet are reserved for net id, so we take first 6 bit of third octet for subnets and subnet mask should be
255.255.11111100.00000000 = 255.255.252.0

17. The routing table of a router is shown below:

Destination	Subnet Mask	Interface
128.75.43.0	255.255.255.0	Eth0
128.75.43.0	255.255.255.128	Eth1
192.12.17.5	255.255.255.255	Eth2
Default		Eth3

(A) Eth1 and Eth3
(B) Eth0 and Eth3
(C) Eth0 and Eth2
(D) Eth1 and Eth2

Break

9:35

17. The routing table of a router is shown below:

Destination	Subnet Mask	Interface
128.75.43.0	255.255.255.0	Eth0
128.75.43.0	255.255.255.128	Eth1
192.12.17.5	255.255.255.255	Eth2
Default		Eth3

(A) Eth1 and Eth3
(B) Eth0 and Eth3
(C) Eth0 and Eth2
(D) Eth1 and Eth2

On which interface will the router forward packets addressed to destinations 128.75.43.16 and 192.12.17.10 respectively? [Gate2004]

Answer: Option A

Explanation:

Router decides route for packet by ANDing subnet mask and ip address.
If results of ANDing subnet masks and ip address are same then subnet mask with higher number of 1s is preferred.

Answer: Option A

Explanation:

Router decides route for packet by ANDing subnet mask and ip address.
If results of ANDing subnet masks and ip address are same then subnet mask with higher number of 1s is preferred.

IP address 128.75.43.16 is AND with 255.255.255.0 results 128.75.43.0 net id which is similar to destination of this mask, but ANDing 128.75.43.16 with 255.255.255.128 also results same destination. So, here, mask with higher number of one is considered and router will forward packet to Eth1.

Answer: Option A

Explanation:

Router decides route for packet by ANDing subnet mask and ip address.
If results of ANDing subnet masks and ip address are same then subnet mask with higher number of 1s is preferred.

IP address 128.75.43.16 is AND with 255.255.255.0 results 128.75.43.0 net id which is similar to destination of this mask, but ANDing 128.75.43.16 with 255.255.255.128 also results same destination. So, here, mask with higher number of one is considered and router will forward packet to Eth1.

ANDing 192.12.17.10 with three subnet mask in table does not result in destination net id so router will forward this packet to default network via Eth2.

18. A subnetted class B network has the following broadcast address:144.16.95.255. Its subnet mask [Gate2006]

18. A subnetted class B network has the following broadcast address:144.16.95.255. Its subnet mask [Gate2006]

(a) is necessarily 255.255.224.0
(b) is necessarily 255.255.240.0
(c) is necessarily 255.255.248.0
(d) could be any one of 255.255.224.0, 255.255.240.0, 255.255.248.0

18. A subnetted class B network has the following broadcast address:144.16.95.255. Its subnet mask [Gate2006]

(a) is necessarily 255.255.224.0
(b) is necessarily 255.255.240.0
(c) is necessarily 255.255.248.0
(d) could be any one of 255.255.224.0, 255.255.240.0, 255.255.248.0

Ans. d

18. A subnetted class B network has the following broadcast address:144.16.95.255. Its subnet mask [Gate2006]

(a) is necessarily 255.255.224.0
(b) is necessarily 255.255.240.0
(c) is necessarily 255.255.248.0
(d) could be any one of 255.255.224.0, 255.255.240.0, 255.255.248.0

Ans. d

Explanation: 144.16.95.255 = 144.16.01011111.11111111
Since last 13 bits are one so it could be broadcast address for any of subnets with mask 255.255.224.0 (with 13 bit for host id), 255.255.240.0(with 12 bit for host id), 255.255.248.0(with 11 bits for host id).

19. Two computers Cl and C2 are configured as follows. Cl has IP address 203.197.2.53 and netmask 255.255.128.0. C2 has IP address 203.197.75.201 and netmask 255.255.192.0.
Which one of the following statements is true? [Gate2006]

19. Two computers Cl and C2 are configured as follows. Cl has IP address 203.197.2.53 and netmask 255.255.128.0. C2 has IP address 203.197.75.201 and netmask 255.255.192.0.
Which one of the following statements is true? [Gate2006]

(A) Cl and C2 both assume they are on the same network
(B) C2 assumes Cl is on same network, but Cl assumes C2 is on a different network
(C) Cl assumes C2 is on same network, but C2 assumes Cl is on a different network
(D) Cl and C2 both assume they are on different networks.

19. Two computers Cl and C2 are configured as follows. Cl has IP address 203.197.2.53 and netmask 255.255.128.0. C2 has IP address 203.197.75.201 and netmask 255.255.192.0.
Which one of the following statements is true? [Gate2006]

(A) Cl and C2 both assume they are on the same network
(B) C2 assumes Cl is on same network, but Cl assumes C2 is on a different network
(C) Cl assumes C2 is on same network, but C2 assumes Cl is on a different network
(D) Cl and C2 both assume they are on different networks.

Ans.C

Explanation:

If C1 wants to check whether C2 is in same network or in different network then C1 ANDs IP address of C2 with C1's subnet mask , if result is same as net id of C1 then C1 assumes that C2 is in same Network

AND	255.255.128.0(subnet mask of C1)	255.255.192.0(subnet mask of C2)
203.197.2.53	203.197.0.0	203.197.0.0
203.197.75.201	203.197.0.0	203.197.64

So C1 assumes that C2 is in same network but C2 assumes C1 is on different network.

20. The address of a class B host is to be split into subnets with a 6-bit subnet number. What is the maximum number of subnets and the maximum number of hosts in each subnet? [Gate2007]

20. The address of a class B host is to be split into subnets with a 6-bit subnet number. What is the maximum number of subnets and the maximum number of hosts in each subnet? [Gate2007]

(A) 62 subnets and 262142 hosts.
(B) 64 subnets and 262142 hosts.
(C) 62 subnets and 1022 hosts.
(D) 64 subnets and 1024 hosts.

CB =

NID = 16

6

22

SN = 6 bits

$s = 2^6 = 64$

HID = 10

$(2^{10} - 2)$

1022 ✓

20. The address of a class B host is to be split into subnets with a 6-bit subnet number. What is the maximum number of subnets and the maximum number of hosts in each subnet? [Gate2007]

(A) 62 subnets and 262142 hosts.
(B) 64 subnets and 262142 hosts.
(C) 62 subnets and 1022 hosts.
(D) 64 subnets and 1024 hosts.

Ans: Given option is wrong, Correct Answer is 64 subnets and 1022 hosts

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(A) 62 subnets and 262142 hosts.
(B) 64 subnets and 262142 hosts.
(C) 62 subnets and 1022 hosts.
(D) 64 subnets and 1024 hosts.

Ans: Given option is wrong, Correct Answer is 64 subnets and 1022 hosts

Explanation: in class B address first two octets are reserved for net id. First 6 bit of third octet can be use for subnet and remaining 10 bits can be used for host id.
If n bits are used for subnet id then maximum number of subnets is 2 n .Similarly, If n bits are used for host id then maximum number of host is 2 n -2.

21. If a class B network on the Internet has a subnet mask of 255.255.248.0, what is the maximum number of hosts per subnet? [Gate2008]

21. If a class B network on the Internet has a subnet mask of 255.255.248.0, what is the maximum number of hosts per subnet? [Gate2008]

(A) 1022
(B) 1023
(C) 2046
(D) 2047

255.255.11111000.00000000

HID = 11

$2^{11} - 2$

21. If a class B network on the Internet has a subnet mask of 255.255.248.0, what is the maximum number of hosts per subnet? [Gate2008]

(A) 1022
(B) 1023
(C) 2046
(D) 2047

Ans. C

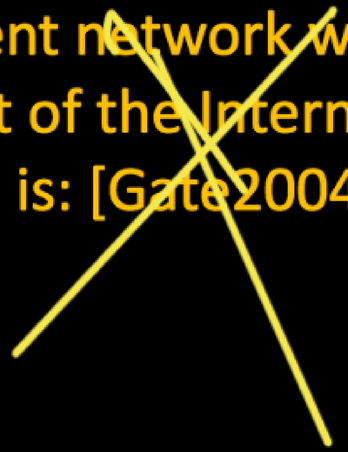
21. If a class B network on the Internet has a subnet mask of 255.255.248.0, what is the maximum number of hosts per subnet? [Gate2008]

(A) 1022
(B) 1023
(C) 2046
(D) 2047

Ans. C

Explanation: 255.255.248.0 can be written as 11111111.11111111.11111000.00000000
Number of bits assigned for host id is the number of zeros in subnet mask. Here 11 bits are used for host id so maximum possible hosts are= 2 11 -2=2046

22. A host is connected to a Department network which is part of a University network. The University network, in turn, is part of the Internet. The largest network in which the Ethernet address of the host is unique is: [Gate2004]



22. A host is connected to a Department network which is part of a University network. The University network, in turn, is part of the Internet. The largest network in which the Ethernet address of the host is unique is: [Gate2004]

(A) the subnet to which the host belongs
(B) the Department network
(C) the University network
(D)the Internet

22. A host is connected to a Department network which is part of a University network. The University network, in turn, is part of the Internet. The largest network in which the Ethernet address of the host is unique is: [Gate2004]

(A) the subnet to which the host belongs
(B) the Department network
(C) the University network
(D)the Internet

Ans. D
Ethernet address is unique globally..

23. A subnet has been assigned a subnet mask of 255.255.255.192. What is the maximum number of hosts that can belong to this subnet? [Gate2004]

23. A subnet has been assigned a subnet mask of 255.255.255.192. What is the maximum number of hosts that can belong to this subnet? [Gate2004]

(A) 14
(B) 30
(C) 62
(D)126

$2^6 - 2$

23. A subnet has been assigned a subnet mask of 255.255.255.192. What is the maximum number of hosts that can belong to this subnet? [Gate2004]

(A) 14
(B) 30
(C) 62
(D)126

Ans. C

23. A subnet has been assigned a subnet mask of 255.255.255.192. What is the maximum number of hosts that can belong to this subnet? [Gate2004]

(A) 14
(B) 30
(C) 62
(D)126

Ans. C

Explanation: Since you have 6 subnet bits so we can make (64-2)=62 hosts.

24. Suppose a subnet X has a subnet mask 255.255.255.192 and a system A has ip 130.127.48.130. Which of the following belongs to same subnet as A ?

24. Suppose a subnet X has a subnet mask 255.255.255.192 and a system A has ip 130.127.48.130. Which of the following belongs to same subnet as A ?

(A) 130.127.48.120
(B) 130.127.48.187
(C) Both (a) and (b)
(D) none of these

24. Suppose a subnet X has a subnet mask 255.255.255.192 and a system A has ip 130.127.48.130. Which of the following belongs to same subnet as A ?

(A) 130.127.48.120
(B) 130.127.48.187
(C) Both (a) and (b)
(D) none of these

ANS. B

25. A router uses the following routing table:

Destination	Mask	Interface
144.16.0.0	255.255.0.0	Eth0
144.16.64.0	255.255.224.0	Eth1
144.16.68.0	255.255.255.0	Eth2
144.16.68.64	255.255.255.224	Eth3

25. A router uses the following routing table:

Destination	Mask	Interface
144.16.0.0	255.255.0.0	Eth0
144.16.64.0	255.255.224.0	Eth1
144.16.68.0	255.255.255.0	Eth2
144.16.68.64	255.255.255.224	Eth3

A packet bearing a destination address 144.16.68.117 arrives at the router. On which interface will it be forwarded? [GAte2006]

(a) Eth0
(b) Eth1
(c) Eth2

25. A router uses the following routing table:

Destination	Mask	Interface
144.16.0.0	255.255.0.0	Eth0
144.16.64.0	255.255.224.0	Eth1
144.16.68.0	255.255.255.0	Eth2
144.16.68.64	255.255.255.224	Eth3

A packet bearing a destination address 144.16.68.117 arrives at the router. On which interface will it be forwarded? [GAte2006]

(a) Eth0
(b) Eth1
(c) Eth2

ANS. C

26. The forwarding table of a router is shown below. [Gate2023]

Subnet Number	Subnet Mask	Interface ID
200.150.0.0	255.255.0.0	1
200.150.64.0	255.255.224.0	2
200.150.68.0	255.255.255.0	3
200.150.68.64	255.255.255.224	4
Default		0

A packet addressed to a destination address 200.150.68.118 arrives at the router. It will be forwarded to the interface with ID _____.

26. The forwarding table of a router is shown below. [Gate2023]

Subnet Number	Subnet Mask	Interface ID
200.150.0.0	255.255.0.0	1
200.150.64.0	255.255.224.0	2
200.150.68.0	255.255.255.0	3
200.150.68.64	255.255.255.224	4
Default		0

A packet addressed to a destination address 200.150.68.118 arrives at the router. It will be forwarded to the interface with ID _____.

Answer - 3

Explanation -

IP Address: Net ID = IP Address (Bitwise AND) Subnet Mask

Explanation -

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Interface 4: subnet mask 255.255.255.224 means Net ID: 200.150.68.96
So, Doesn’t match

Explanation -

IP Address: Net ID = IP Address (Bitwise AND) Subnet Mask

Interface 4: subnet mask 255.255.255.224 means Net ID: 200.150.68.96
So, Doesn’t match

Interface 3: subnet mask 255.255.255.0 means Net ID: 200.250.68.0
So, Does match

Explanation -

IP Address: Net ID = IP Address (Bitwise AND) Subnet Mask

Interface 4: subnet mask 255.255.255.224 means Net ID: 200.150.68.96
So, Doesn’t match

Interface 3: subnet mask 255.255.255.0 means Net ID: 200.250.68.0
So, Does match

Interface 2: subnet mask 255.255.224.0 means Net ID: 200.150.64.0
So, Does match

Explanation -

IP Address: Net ID = IP Address (Bitwise AND) Subnet Mask

Interface 4: subnet mask 255.255.255.224 means Net ID: 200.150.68.96
So, Doesn’t match

Interface 3: subnet mask 255.255.255.0 means Net ID: 200.250.68.0
So, Does match

Interface 2: subnet mask 255.255.224.0 means Net ID: 200.150.64.0
So, Does match

Interface 1: subnet mask 255.255.0.0 means Net ID: 200.150.0.0
So, Does match

Explanation -

IP Address: Net ID = IP Address (Bitwise AND) Subnet Mask

Interface 4: subnet mask 255.255.255.224 means Net ID: 200.150.68.96
So, Doesn’t match

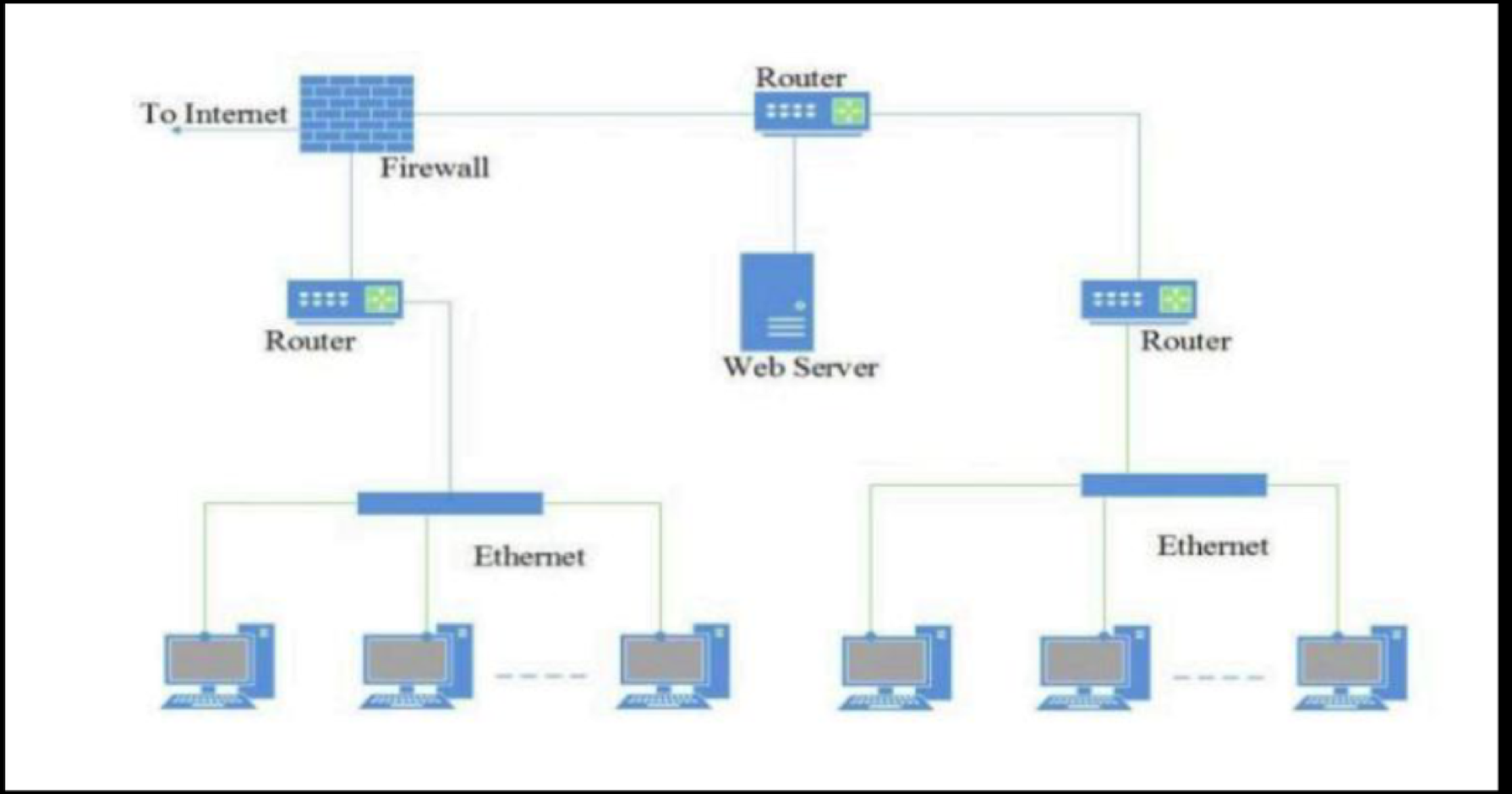
Interface 3: subnet mask 255.255.255.0 means Net ID: 200.250.68.0
So, Does match

Interface 2: subnet mask 255.255.224.0 means Net ID: 200.150.64.0
So, Does match

Interface 1: subnet mask 255.255.0.0 means Net ID: 200.150.0.0
So, Does match

Interface 3,2,1 matches but we have to select Interface with Longest subnet mask (More 1’s).So, Interface 3 is the Answer

27. Consider an enterprise network with two Ethernet segments, a web server and a firewall, connected via three routers as shown below.



What is the number of subnets inside the enterprise network? [Gate2022]

What is the number of subnets inside the enterprise network? [Gate2022]

(A) 3
(B) 12
(C) 6
(D) 8

What is the number of subnets inside the enterprise network? [Gate2022]

(A) 3
(B) 12
(C) 6
(D) 8

Answer C

What is the number of subnets inside the enterprise network? [Gate2022]

(A) 3
(B) 12
(C) 6
(D) 8

Answer C

Explanation -
For each interface, the router has one entry in the routing table.
Each interface out of a router = 1 subnet
So, here 2 + 3 + 2 = 7
but 1 is common (router to router) so 7 - 1 = 6