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Assignment - CN

Answer 1:- For real time application like vedio conferencing, where delay and packet loss can significantly impact the users experience, UDP will be a better option because of the following reasons:-

→ No congestion control.
→ Reduced overhead.
→ Faster transmission
→ Application level control.

As these properties were missing in TCP model it will be a good idea to use UDP for the application.

Answer-2:- Total usable IP = $2^{(20-8)}$ = 4096

ORG A = 4096/2 = 2048 addresses
ORG B = 4096/4 = 1024 "
ISP = Remaning 1024 addresses.

ORG A = 245.248.136.0/21
ORG B = 245.248.128.0/22
ISP = The remaning (245.248.128.0/22)

Answer-2.

A 128.96.171.92 ⟶ Interface 0.

B 128.96.167.151 ⟶ R_2

C 128.96.163.121 ⟶ R_4

D 128.96.165.121 ⟶ R_3

Answer-4 :-

255.255.255.252 = 11111111 11111111 11111111 11111100

H = 100.10.5.2 = 01100100 00001010 00000101 00000010

= 01100100 00001010 00000101 00000000

N = 100.10.5.5 = 01100100 00001010 00000101 00000101

⇒ 01100100 . 00001010 . 00000101 . 00000100

P = 100.10.5.6 ⇒ 01100100 00001010 . 00000101 00000110

⇒ 01100100 . 00001010 00000101 00000100

option C :- only N & P belong to same subset.

Answer-5 :- 200.10.11.11/27

11001000 00001010 00001011 . 10010000

n = 27

mask = 30-27 . 5 bits

last address :- 11001000 00001010 00001011 10011111

(200.10.11.159)

last IP address :- (200.10.11.159)

Answer 6:- IP address = 192.168.192.10/29

11000000.10101000.11000000.00001010

n=29

A/29 (255.255.255.248) has a block size of 8 bit in fourth octate. This means the subnets are 0, 8, 16, 24.

10 is in the 8 subnet. the next subnet is 16.

So, 15 is the broadcast address.

(192.168.192.15)

Answer 7:- To accomodate 6 subnets, we need atleast 3 bits ($2^3=8$). After subnetting the mask will be 127 as we are taking away 3 bits for sub-netting.

The new subnet mask will be 255.255.255.224.

i) Subnet 1

Network address = 193.56.7.0

First usable IP address = 193.56.7.1

Last usuable IP address = 193.56.7.30

Broadcast address: 193.56.7.31

ii) Subnet 2

Network address = 193.56.7.32.

First usable IP address = 193.56.7.33

Last " " " = 193.56.7.62.

Broadcast address = 193.56.7.63

iii) Subnet-3

Network address = 193.56.7.64

First usable IP address = 193.56.7.65

Last " " " = 193.56.7.94.

Broad cast address = 193.56.7.95

iv) Subnet-4

Network address = 193.56.7.96

First usable IP address = 193.56.7.97

Last " " " = 193.56.7.126

Broadcast address = 193.56.7.127

v) Subnet-5

Network address = 193.56.7.128

First usable IP address = 193.56.7.129

last " " " = 193.56.7.159.

Broad cast address :- 193.56.7.159

vi) Subnet-6

Network address :- 193.56.7.160

First usable IP address = 193.56.7.161

last " " " = 193.56.7.190

Broad cast address = 193.56.7.191.

Last Subnet ranges from :- 193.56.7.160 to 193.56.7.191

Answer 8:- The first step will be to check if the IP configuration is correct or not. The following are few steps:-

→ Check IP configuration
→ Check network connectivity
→ Check Internet connectivity.
→ Check for network restrictions or firewall rules.
→ Check for IP conflicts.

Answer 10:- The following are the steps for TCP Connection establishment process.

→ SYN: (Synchronization) flag set to ~~zero~~ server.
→ SYN & - ACK: Acknowledgement flag set.
→ ACK: Client sends an acknowledgement to server's SYN - ACK.

Termination Process :- when clients sends a FIN segment containing data ranging from sea number 100 to 200, the server needs to acknowledge the data.

The server's ack will start from 201. It acknowledges the receipt of all data upto sequence number 200 and indicate that it is ready to receive the next sequence number, which would be 201.

Answer 11 :- To transmit the IP datagram of size 1000 bytes over a link with a MTU of 100 bytes fragmentation required. Here's how the fragmentation process works:-

Calculate the payload size = MTU − IP header size
= 100 − 20 = 80 bytes.

No. of fragments = $\frac{1000}{80}$ = 12.5 // Ans

Answer 12:- Original packet size = 4404 bytes.
MTU of router = 1500 bytes.
Fragment size = MTU − IP
= 1500 − 20 = 1480 bytes.

No. of fragments = $\frac{4404}{1480}$ ≈ 2.979.

Fragment offset = $2 \times \frac{1480}{8}$ = 370 //

Answer 13:- Subnet mask :- 255.255.255.252

11111111 11111111 11111111 11111100

M:SP add :- 100.10.5.2

01100100 . 00001010 . 00000101 . 00000010

Subnet mask and M/S IP Address.

01100100 . 00001010 . 00000101 . 00000000

Subnet id = 100.10.5.0

Answer 17:- No. of host per subnet = $2^{31}-2$

for 2 subnetting we need 1 bit resulting subnet mask to be : 255.255.255.128

Subnet mask: 255.255.255.128 (125)

Subnet address :- To find the subnet address we set subnet bit to a and rest of the bits are to.

192.16.0.0

First-host :- 192.16.0.1.

Last-host :- 192.16.0.126

Broadcast-address :- 192.16.0.127

~~192.168.1.0~~.

Answer 18 :- /29 means 3 bits are used for hosts then subnet mask will be 255.255.255.248.

IP : 192.168.192.10

Subnet mask : 255.255.255.248

Network address :- 192.168.192.8

Broadcast address :- 192.168.192.15

Answer 19 :- In IPv4 0100 should be in version field. Any other value in this field will indicate different versions of IP protocol. Hence it discards it.

Answer 20 :- HLEN = 1000 (binary) = 8 (decimal)

length of IP header = 8x4 = 32.

length of IP ~~header~~ header = 32 Ans

Answer 9:- The distance vector C as (4,2,0,2,4,5,5).
Hence option D is correct.

Answer 16:- In the next round, every node will send and receive distance vector and from neighbours & update it's distance vector. N_3 will receive (1,0,2,7) from N_2. it will update distance to N_1 & N_5 as 3 and 5 respectively.
Hence (3,2,6,2,5)