Name : Lakhan Kumawat
Roll No: 1906055
Branch: CSE-1

Course: Computer Networks

Course Code: CS5403

Date: 12/01/2021

Assignment - 3

Solution 1:

Address : 245.248.128.0/20.

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Since routing prefix is 20, the isp has $2^{(32-20)}$ or 2^{12} addresses.

Out of 2^{12}, (2^{11}) are given to organisation A and (2^{10}) are given to organisation B

So routing prefix for organization A will be 21. For B it will be 22.
If we see all options in question, only options (A) and (B) are left as only these options have same number of routing prefixes.

To assign addresses to organization A, ISP needs to take first 20 bits from 245.248.128.0 and fix the 21st bit as 0 or 1.

Similarly, ISP needs to fix 21st and 22nd bits for organisation B. Here 21st and 22nd bits for organisation B are considered 0 in both options. So 21st bit of organisation A must be 1. Now take the first 20 bits from 245.248.128.0 and 21st bit as 1, we get addresses for organisation A as 245.248.136.0/21.

So Correct option is (A) 245.248.136.0/21 and 245.248.128.0/22

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Solution 2. The correct answer is (D). 255.255.255.224.

The last octets of IP addresses of A and B are 173 (01110001) and 91 (01011011). The netmask in option (D) has first three bits set. Then these bits must be same in A and B, but that is not the case. In simple words, we can say option (D) is not valid netmask because doing binary '&' of it with addresses of A and B doesn't give the same network address. It must be same address as A and B are on same network.

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Solution 3: Given Class B has a subnet mask of 255.255.248.0

The binary representation of given subnet mask is

11111111.11111111.11111000.00000000

There are 21 bits set in subnet. So 11 (32-21) bits are left for host ids.

Total possible values of host ids are $2^{11} = 2048$.

Out of 2048 values, 2 addresses are reserved. The address with all bits as 1 is reserved as broadcast address and address with all host ids bits as 0 is used as network address of subnet.

In general, the number of addresses usable for addressing specific hosts in each network is always $2^N - 2$ where N is the number of bits for host id.

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Solution 4: Given: Class B host is split into 6-bit Subnet number.

Maximum number of Subnets = $2^6 - 2 = 62$

The RFC 950 Specification reserves the subnet values consisting of all zeros and all the ones reducing the number of available subnets by two.

Maximum number of hosts is $2^{10} - 2 = 1022$

The address with all bits as 1 is reserved as broadcast address and address with all host id bits as 0 is used as network address of subnet. In general, the number of addresses usable for addressing specific hosts in each network is always $2^N - 2$ where N is the number of bits for host id.

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Solution 5:

	Transmission Control protocol TCP	User Datagram protocol UDP
Definition	It is a communications protocol, using which the data is transmitted between the systems over the network. The data is transmitted in the form of packets. It also includes error checking and guarantees the delivery and preserve the order of data packets.	UDP is same as TCP protocol except this doesn't guarantee the error-checking and data recovery. The Data is sent continuously irrespective of the issues in the receiving end.
Design	It is Connection-oriented protocol.	UDP is Connection less protocol.
Reliability	More reliable as it provides error checking support.	Less reliable as Compared to TCP as it provides only basic error-Checking support.
Data-Transmission	There is a proper sequencing of data in TCP i.e. packets arrive in order at receiver's end. E.g. Network telephone	There is no sequencing of data in UDP E.g. live-streaming