Assignment 5

Maximum Marks: 100

DUE: 19 March 2020 (Thursday)

Note: Please show your working for full credit
Note for references: Adding references does not allow you to copy text word to word
To get full credit, for all questions that require subnetting, show how you got to the solution.

Q1. (5 Marks) What is the subnetwork address for a host with the IP address 200.15.9.64/28?

Q2. (5 Marks) The network address of 172.18.0.0/19 provides how many subnets and hosts?

Q3. (10 Marks) Provide the network address, broadcast address and subnet mask for the following IP address.

a. 40.45.76.81/21
b. 172.8.30.146/23

Q4. (10 Marks) Subnet a Class C network 223.1.XX.0/24 into three subnets in the most efficient way (HINT: Start to subnet with the largest subnet). First subnet has 90 hosts, second has 60 hosts and the third has 12 hosts. Just give the Network and the Broadcast address for each subnet along with the subnet mask. Use your NUID in place of "XX".

Q5. (10 Marks) Jim and Tom arrive together in the library and turn on their computers and have their computers connected to the same link. During the process of obtaining an IPv4 address from the DHCP server, Jim realizes that the IP address advertised to him is already being used by Tom. Answer the following questions in one line each

a) What is this scenario called?
b) How does Tom realize that?
c) What will Tom do next?

Q6. (10 Marks) Explain minimum four scenarios which are responsible for the packet drop at the router interface.

Q7. (10 Marks) What is a private network address? How is a device with a private network address represented on the public internet?

Q8. (40 Marks) Design a network with all the known network elements (router, switch, etc.,) to you to accomplish the following case (40 Marks) Hints: using CPT to create your topology, no configuration required.

> Sundar Communications (SComm) which resides in Tewksbury, Massachusetts, have decided to join hands with Magesh Networks (MNets) which is based in Burlington, Massachusetts. Both are startups and have 3 workstations and 1 server each. Both the firms plan to merge and come up with new venture SM Inc. providing high-speed connectivity between the offices in Tewksbury and Burlington.

You are required to design high-level network architecture. Kindly explain with the following aspects:

- Block diagram
- IP addresses along with subnets
- Network components and their functions

I. Based on your answers for the above question, please fill in the blanks and one-line reason for your answers

> - SComm is under _____ (LAN / WAN / MAN) - MNets is under _____ (LAN / WAN / MAN) - SM Inc. is under _____ (LAN / WAN / MAN)

II. Whom would they approach to merge their networks

> A. Tier I ISP
> B. Tier II ISP or Tier III ISP
> C. Tier III ISP
> D. None of the above

III. What type of IP addressing would they use in their existing internal networks?

> A. Classless addressing
> B. Class A
> C. Class B
> D. Class C
> E. Class D or Class E

IV. What type of IP addressing would they use in their new (SM Inc.) network?

> A. Classless addressing
> B. Class A
> C. Class B
> D. Class C
> E. Class D or Class E