CS447 - Networks and Data Communications
Possible Quiz Questions (Quiz #8)
For October 29th, 2019

The following is a list of possible questions for our quiz on October 29th. Some of the questions will not be asked in the quiz. All the questions that will appear in the quiz will appear exactly as shown below (however, numeric parameters may be changed). The quiz is closed textbook, closed notes and closed neighbors. Note that the questions, which did not appear in this quiz, still may appear in the exams. You will find a solution for these questions during lectures.

#1: What is “IP address” (what does each IP address represent)?

#2: Each IP address consists of two “addresses”. What are they?

#3: What is “domain address”?

#4: What is “host address”?

#5: Why does each IP address consist of two addresses of “domain address” and “host address” (what is the motivation behind the design)?

#6: What is “subnet”?

#7: What is “subnet” for?

#8: Mention two purposes of subnet mask.

#9: Is “254.254.80.90” a valid subnet mask? If yes, how it is a valid subnet mask? If not, why not?

#10: Given a following IP address: 191.56.98.201/10 and there are up to 64 sub-networks in that domain, find the actual host address (without including the sub-network address) if the domain’s subnet mask is “255.255.240.0”. Show all your work. Note: the parameters (the IP address, IP prefix, the number of sub-networks and the subnet mask) will be changed in the real quiz question.

#11: What does “CIDR” stand for?

#12: How many host computers can exist for a network domain that has “/25” CIDR block-prefix?

#13: How do Internet core routers use CIDR block-prefix?

#14: Given a following IP address: 191.56.98.201/10 and there are up to 64 sub-networks in that domain, find the sub-network address if the domain’s subnet mask is “255.255.240.0”. Show all your work. Note: the parameters (the IP address, IP prefix, the number of sub-networks and the subnet mask) will be changed in the real quiz question.
#15: If a domain has 8,000 host computers (i.e., needs 8,000 IP addresses) and if the domain is supposed to have 10 subnets, what is its subnet mask (answer in the standard “x.x.x.x” format, where ‘x’ is a decimal number between 0 and 255)?

#16: What does “BGP” stand for? What is the protocol for?

#17: What is “AS Number”?

#18: Show the structure of the BGP routing table.

#19: What does “Next Hop” in the BGP table mean?

#20: What does “AS-PATH” in the BGP table mean?

#21: If more than one AS-PATH exits to reach a destination domain in the BGP routing table, how does BGP pick one?

#22: What is “default gateway”?

#23: Why does each host computer (the one connected to the Internet) should have the IP address for “default gateway”?

#24: Briefly describe the procedure for how an AS learns the path to reach a remote destination AS using BGP.

#25: In BGP routing, ISP’s are categorized to three different ISP’s. What are the three categories?

#26: Which types of routing (source routing, centralized routing or distributed routing) should BGP be categorized to? Justify your choice.

#27: What is the difference between “routing protocols” and “routing algorithms”?

#28: Show the structure of the Internet as the interconnections of the three different types of ISP’s.

#29: In the interconnections of ISP’s (AS’s) in the Internet, there are two types of relationships exist between two ISP’s. What are they?

#30: Tier-1 ISP’s are considered special ISP’s in the Internet (by network administrators). What do you think is the most unique property in tier-1 ISP’s that makes them very unique ISP’s in the Internet?

#31: What is the essential difference between “ISP” and “AS”?

#32: What is “IXP (Internet eXchange Point)”?

#33: What is “MAC” address?
#34: What is “physical address”?

#35: What is “logical address”?

#36: Describe the relation between MAC address, IP address and host name.

#37: Why are three different addresses (“MAC address”, “IP address”, and “host name”) assigned to a host computer (to be exact, “to each NIC”) in the Internet?

#38: What does “ARP” stand for? What is it for?

#39: How can a transmitting host computer know the MAC address of the destination host computers? Explain how, for the following two different cases: (a) if the destination is in the same network domain and (b) if the destination is not in the same network domain (i.e., in another remote domain).

#40: What is the mechanism to reduce the number of “ARP broadcasts”?

****** Two Additional Questions ********************

#41 (NEW): What is “DHCP” for?

#42 (NEW): Why can not some host computers in a network domain be dynamically assigned an IP address by DHCP?