CS 547 Network Programming
Spring 2023
Quiz #2 on January 26, 2023 (suggested solutions)

Your Last Three Digits: ________________
(please do NOT write all of your student ID or your name)

Grade: ______

***************************************************

(1) What is “tunneling” (as a technical definition)?

Transmitting payload data by intentionally deviating from the standard protocol suites.

(2) What are the two major benefits in using tunneling?

① To extend the scopes of the existing networks

② To emulate transmission services not available in a network

Note: This question does not ask examples of the existing tunneling protocols (e.g., MBone, 6Bone, Soft-LAN, layer-3 VPN, and etc.)

(3) Describe the five activities “Soft-LAN” performs to let a remote host computer over the Internet to logically join a LAN over the Internet.

Solution: activities ① through ⑤ in the PPT slide above.
(4) What is “Mbone”? How does “MBone” work?

MBone is a layer-3 tunneling, (a) which transmits multicast packets (“IP multicast packets”) using unicast packets through “unicast routers” (b) by encapsulating an IP multicast packet (not “multicast payload”) in an IP unicast packet.

Notes:
• (a) is required for answering the first question (“What is “Mbone”? “).
• (b) is required for answering the second question (“How does “MBone” work? “).

(5) What is “Virtual LAN hub”? How does it differ from “VLAN”?

(a) “Virtual LAN hub” is a virtual (i.e., a software-implemented) LAN hub, that acts as a hub in the public network space (instead of within a local area network), such as the Internet. Each participating host computer establishes a Soft-LAN connection to a “virtual LAN hub”. Multiple host computers that (logically) connect to a virtual LAN hub see that all of the participating host computers as if they were all connected to a LAN segment.

(b) VLAN is a technique to split one hardware hub (LAN switch) into multiple LAN segments. VLANs do not extend the scopes of the existing networks, instead, they split existing networks.

Notes:
• (a) is required for answering the first question (“What is “Virtual LAN hub”? “).
• (b) is required for answering the second question (“How does it differ from “VLAN”? “).