# Computer Networks (14033103-4)

Homework #2

Q1: A set of LANs are linked using bridges to create the bridged network depicted by the figure bellow. The bridges communicate configuration BPDUs to build a spanning tree to prevent loops within the network. If all bridges start the spanning tree algorithm (all bridges are initialized), answer the following questions (assume that the circles in the figure are the bridges and the ID for each bridge is the number inside these circles. Also assume that the state of each bridge is changing in sequence according to the information in each question)
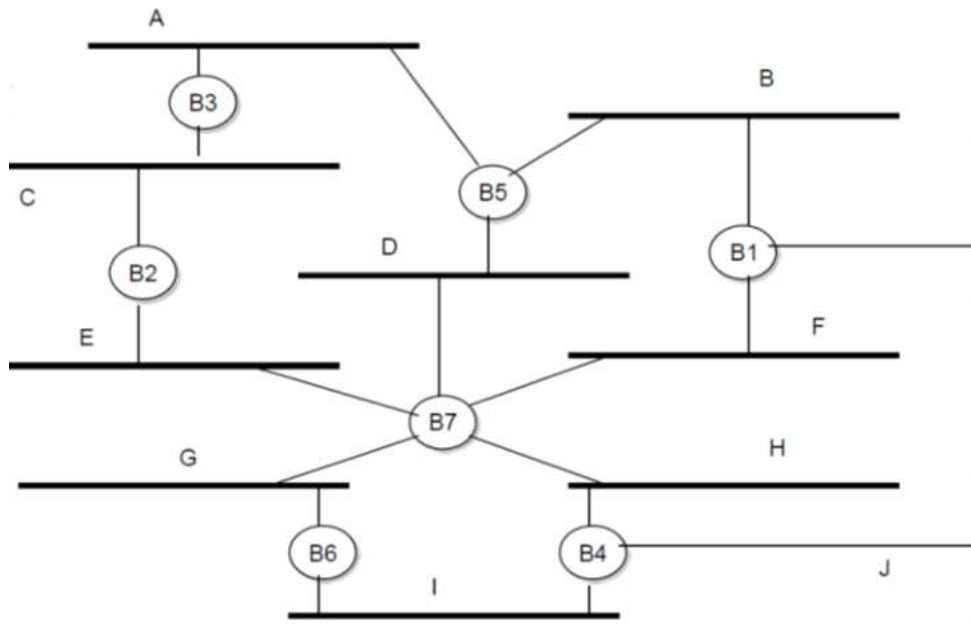
a) What is the initial configuration BPDU for **B6**?

B6	0	B6

b) What is the configuration BPDU of **B2** after receiving the initial configuration BPDU of **B7**?

B2	0	B2

c) If **B3** accepted B2 as the root, what is the configuration BPDU of **B3**?

B2	1	B3

d) If **B3** accepted **B1** as the root through **B5**, what is the configuration BPDU of **B3**?

B1	2	B3

e) Which bridge is the designated bridge of **LAN C** at this time?

B3

f) Now, if **B7** accepted **B1** as the root, what is the configuration BPDU of **B2** after receiving the new configuration BPDU of **B7**?

B1	2	B2

g) Which bridge is the designated bridge of **LAN C** at this time?

B2

Q2: If an organization is given the IP addresses block 202.151.48.0/24, answer the following:

a) How many addresses does the organization have (including network and broadcast addresses)?

2^8 = 256 addresses

b) If the organization decided to divide its network into 2 sub networks. Show the addresses block, the network and broadcast addresses, the range of valid host addresses of each subnetwork.

|	Subnet addresses block	Network Address	Broadcast Address	Valid Hosts Addresses Range
1st subnet	202.151.48.0/25	202.151.48.0	202.151.48.127	202.151.48.1 to 202.151.48.126
2nd subnet	202.151.48.128/25	202.151.48.128	202.151.48.255	202.151.48.129 to 202.151.48.254

Q3: If a routing table of a router is depicted by the following table, **what is the next hop for a packet to be delivered to the IP address 195.82.207.101?** (circle your answer in the table)

| Network	Next Hop
195.82.207.0/24	R1
195.82.207.104/30	R2
195.82.207.100/30	(R3)
195.82.207.96/29	R4

Extra:

- The 4th octet of the given destination IP address is 101 = 01100101
- The address with longest prefix matching is 5.82.207.100/30 (Notice the first 30 bits of the address matches the target destination).
   - The first and fourth network addresses matches the target destination but are not the longest prefix match.
   - The second address does not match the targeted destination (check 4th octet)

Q4: In the following figure that represent an internet, answer the following questions.
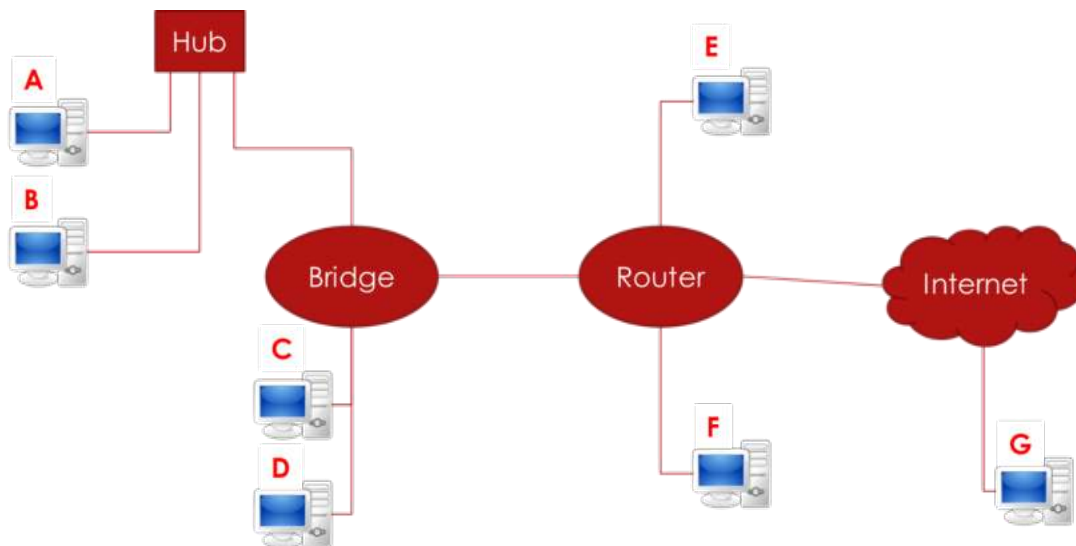
a) Which hosts are in the **collision domain** of host A? **Host B**
b) Which hosts sees the **ARP message** from host A? **Host B, C, and D (hosts in the broadcast domain with host A)**

Q5: If Host A in the following network used MTU discovery protocol to send packets to Host B, what will be the size of the packets that A sends?
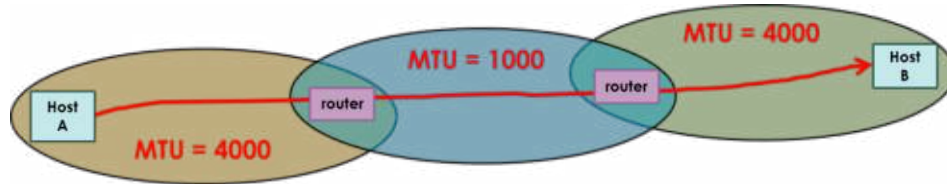
1000 bytes.

Extra:

To discover the MTU of each network between Host A and Host B, Host A sent a packet of size 4000 bytes with <u>do not fragment flag</u> set to 1. Host A received ICMP packets from the first routers indicating that the packet is not reachable and the MTU is 1000 bytes. Subsequently, Host A sent a packet of size 1000 bytes and did not get any further ICMP messages. Thus, Host A learned that the minimum MTU to reach Host B is 1000 bytes and will send packets of this size to Host B.