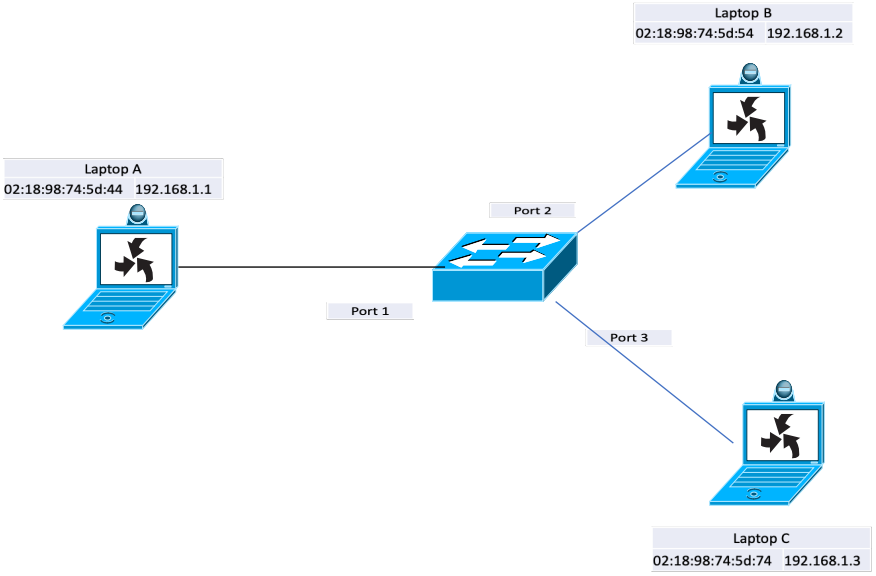
CS-GY 6843 Spring 2021 Midterm

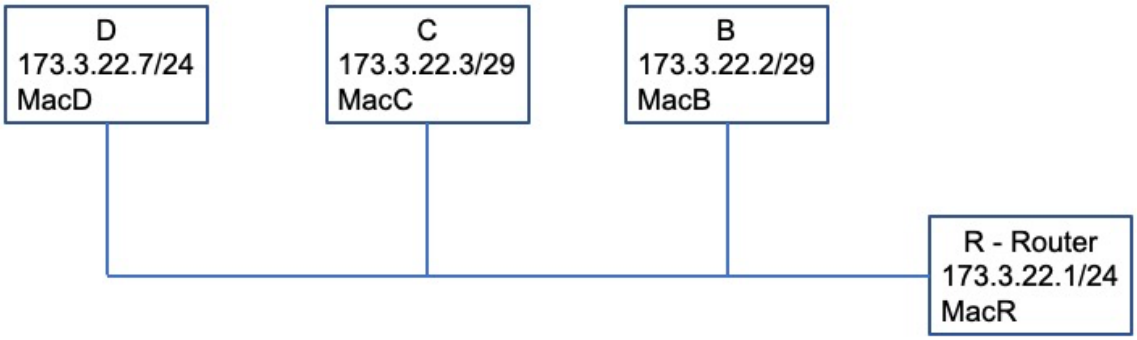
Lasty Name:_____ First Name:_____Net ID:_____

1) Refer to the following diagram with 4 elements:



a) (5 pts) Identify the broadcast domain(s) by listing the networking elements that make up the broadcast domain.
b) (5 pts) Identify the collision domain(s) by listing the networking elements that belong to each collision domain.
c) (10 pts) If laptop A issues an ARP Request for 192.168.1.2 what do each of the elements learn, if anything? Identify the protocol steps (layer2 & layer3) and addresses. What is stored in the ARP tables of each host and the CAM table of the switch?
d) (10 pts) If laptop B sends an ARP Reply to laptop A what do each of the elements learn, if anything? Identify the protocol steps (layer2 & layer3) and addresses. What is stored in the ARP tables of each host and the CAM table of the switch?

2) (10 pts) In the following network diagram, all computers are on the same shared Ethernet segment. If B sends an ICMP Request to 173.3.22.7 what does each of the hosts learn and how do they respond?



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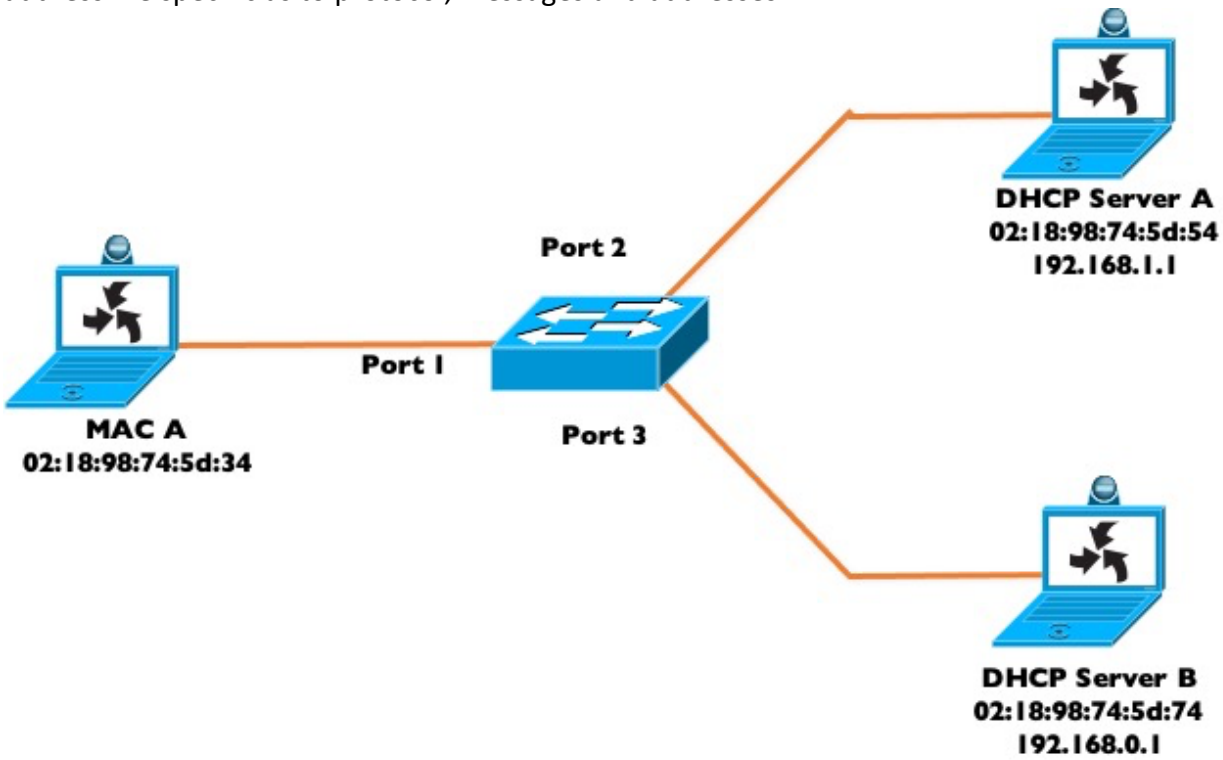
3) (20 pts) Describe the DHCP operations that occur when MAC A wants to obtain an IP address. Be specific as to protocol, messages and addresses.



4) (10 pts) traceroute is a program that shows all the routers (IP address) an IP packet goes through to reach its destination address. Knowing the IP packet data structure and the IP protocol explain how traceroute works.
5) (30 pts) Explain how TCP works; sequence numbers, ack numbers, receive window, sliding window, etc. You may use one or more diagrams to help with your explanation.