

**BRAC UNIVERSITY**  
**Department of Computer Science and Engineering**

Examination : Semester Final  
 Duration: **2 Hour 30 Minutes**

Semester: **Spring 2023**  
 Full Marks: 100

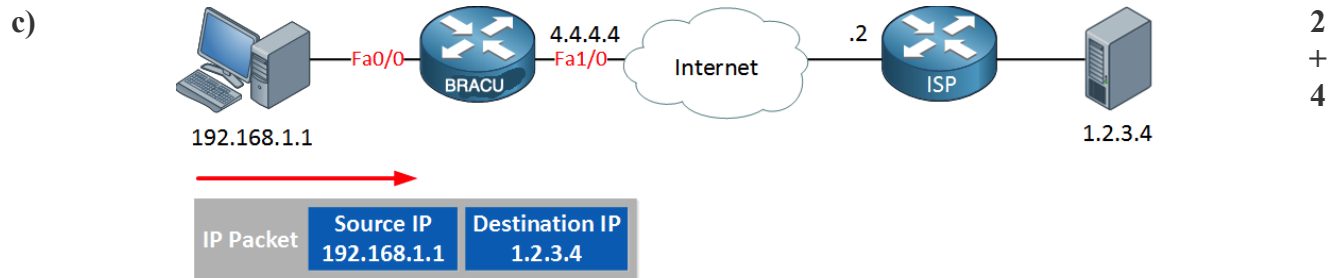
CSE421 / EEE465 : Computer Networks

Answer **ANY FIVE** of the following **SIX** questions. (Pages: 3)

Figures in the right margin indicate marks.

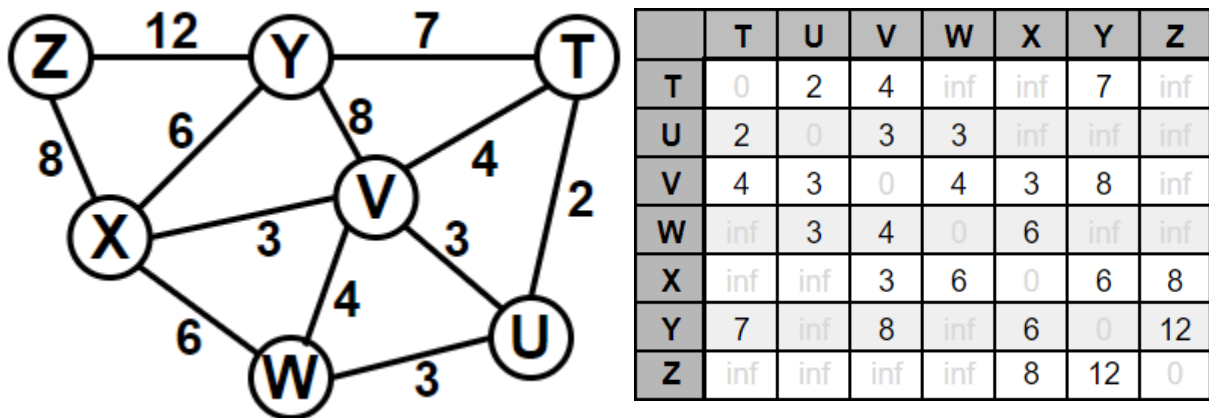
Name:	ID:	Section:
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- Q 1. a)** The default gateway's IP address in a network is assigned to be 109.0.8.253. The network can support about 2045 devices after assigning the above IP. 4  
**CO1** +
- Identify the subnet mask and the broadcast address of the given network. 2
  - State the host size of the given network.
- b)** Using the network address found in (1.a.I), **calculate** the subnet addresses that will create the minimum amount of waste for the following host requirements: a WAN link and a switched network connected to 4 routers, LANs of size 500 and 255 hosts. 14
- Q 2. a)** In "Traceroute" application, the originator sends the first packet with TTL=1 and continuously increments it and resends the packet. How does it know that the packet has reached the destination, that is, how does it know when to stop? 4  
**CO2** +
- b)** You receive a packet whose data length is 900 bytes, ID is 2398 and the MF flag is set to 0. You received the remaining 12 packets, each of whose total length is 1945 bytes, ID is 2398 and the MF flag is set to 1. All of these packets' header size is 25 bytes. 4  
+
- Find the packet size of the original datagram +
  - Find the value of the offset field of the 2nd last packet [First data byte number starts at 0] 2
  - How would you identify the last packet in a group of fragmented packets?



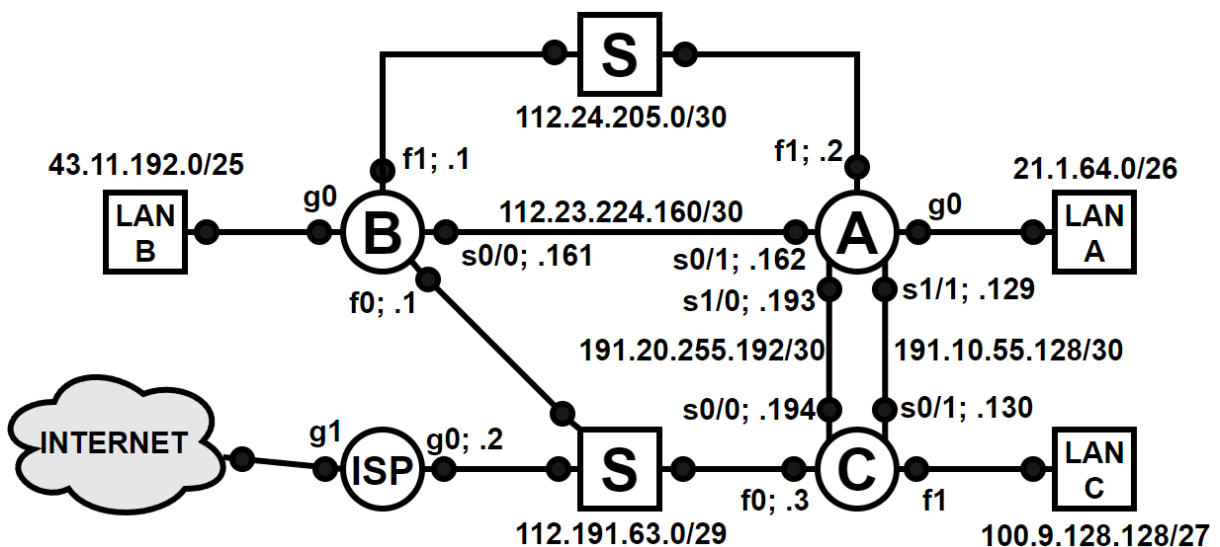
State why BRACU Router is unable to send this packet through the Internet. And what will be the solution to this problem, especially when the internal network connected to BRACU router has 500 hosts.

- Q 3. a) Refer to the following network topology (next page top) and the current routing distance of each router. The routers are running the shortest path algorithm in a decentralized manner. 2  
CO3 +
- Determine the name of the algorithm used in this topology. 8
  - Assuming Router V is not sending any updates to Router T, show the updated table of T after one iteration. Show your equations.



- In the distance vector algorithm, a router sends its routing table updates to all the outgoing neighbors, regardless of any change in its table. State how Link State is different in this aspect. 5
- What's the reason behind distance vector converging slowly with respect to the link state algorithm? 5

- Q 4. a) 5  
CO4



Create a directly attached static route on Router C for LAN B via Router A.

- A primary static route on Router B for LAN A via the WAN Link is present with an AD of 5. Write a floating static route on Router B to access LAN A via the multi-access network. Also state how static route commands through multi-access networks are different. 4
- How can you identify static routes from a routing table? Write the output of the 'show ip route' command when Router C has not been configured with any static or dynamic routes. 3

**Q 5. a)** **Differentiate** between stateless and stateful DHCPv6, and state, in what scenarios might you choose to use one over the other. 6+  
3

**CO3**

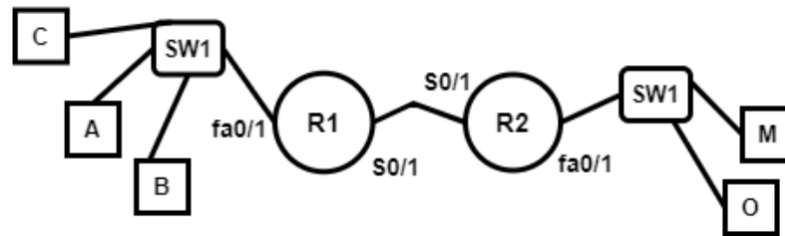
**b)** **State** the purpose and benefit of the “Flow Label” field. 5

**c)** **State** in which scenarios the tunneling transition strategy works best. And where do we need the dual stack routers to be placed when using tunneling strategy? 3  
+  
3

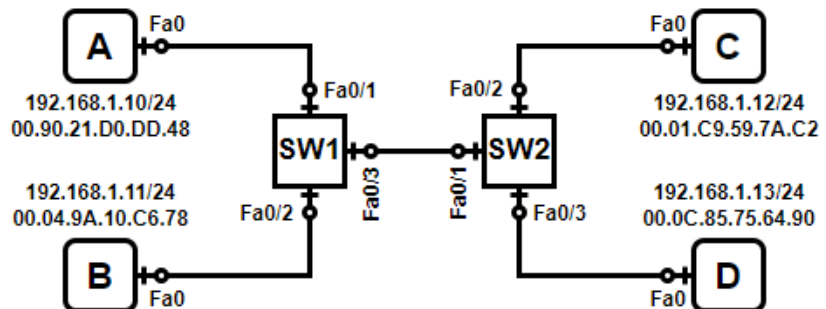
**Q 6. a)** Excluding the format of the addresses, **identify** how MAC is different from the IP address. 4

**CO4**

**b)** Host A wants to communicate with Host M. Host A knows the IP address of M. To complete the destination MAC address field of the data packet to be sent to host M, host A will have to perform an ARP. State for which device’s IP address, host A will send the ARP. After receiving the ARP reply, **what** will host A do next? 3  
+  
4



**c)** The MAC address table of switch SW1 contains information of **host D & A**, while SW2 is empty. Now **host B** sends an ARP request packet for **host C’s** MAC address. **Explain** what the two switches do with this packet in terms of unicasting and flooding. **Show** the updated MAC address tables of both the switches.



===== **THE END** =====