

BRAC UNIVERSITY
Department of Computer Science and Engineering

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

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

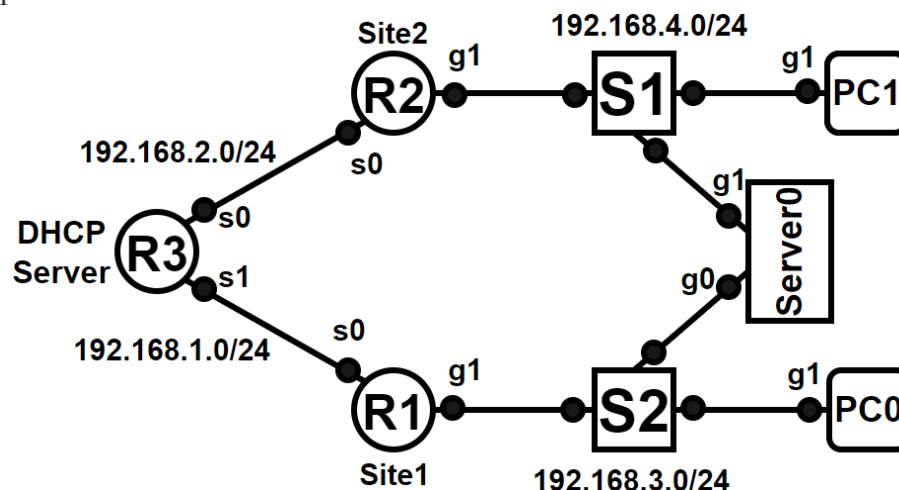
CSE421 / EEE465 : Computer Networks

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

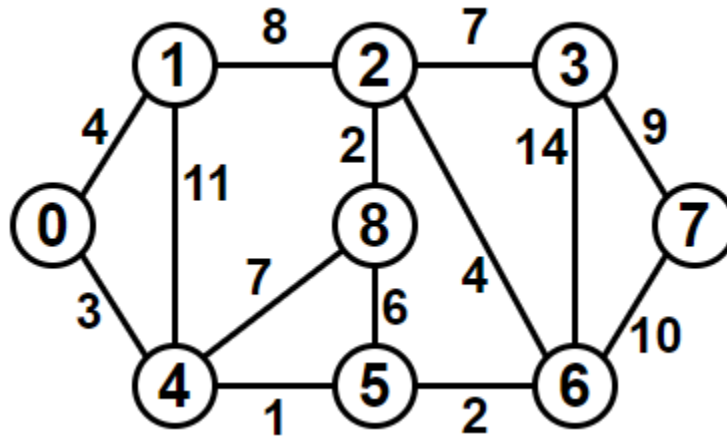
Figures in the right margin indicate marks.

Name:	ID:	Section:
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- Q 1. a)** The second last usable IP address in a network is 109.127.255.253 while the IP of the default gateway, also the first usable IP address, is 109.64.0.1. 4
- CO1** +
- Identify the subnet mask & the network 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 2000 and 1400 hosts. 14
- Q 2. a)** Identify what is denoted by “TTL=104” in the following ping output. 4
- CO2** +
- Pinging **www.google.com [142.251.12.94]** with 32 bytes of data:
 Reply from 142.251.12.94: bytes=32 time=50ms TTL=104
- b)** You receive a packet whose total length is 985 bytes, ID is 4567 and the MF flag is set to 0. You received the remaining 10 packets, each having a total length of 2883 bytes, ID of 4567 and the MF flag is set to 1. All of these packets' header size is 35 bytes. 4
- Find the data size of the original datagram before fragmentation. +
 - Find the value of the offset field of the 2nd packet [First data byte number starts at 0] 2
 - How would you identify the last packet in a group of fragmented packets?
- c)** PC1's DHCP Discover packet is unable to reach Router R3, which is configured as the DHCP server. **State** the most probable reason why and the solution to the problem. Be as specific as possible. 3
- +
3

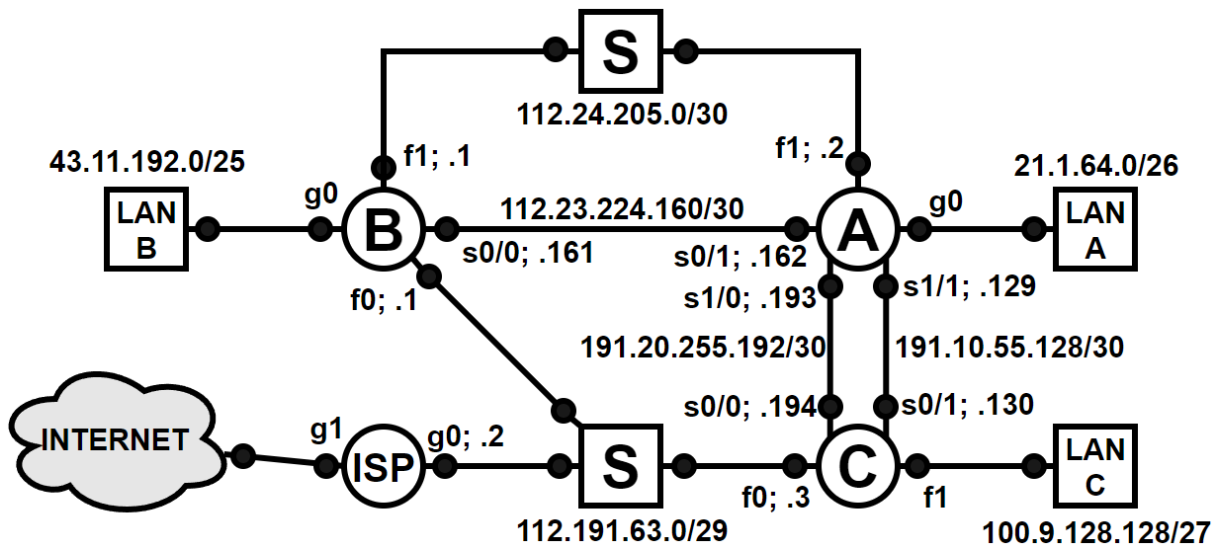


- Q 3. a) Refer to the following network topology and the current routing distance of each router. The routers were detected to converge very fast with true shortest paths. 2
CO3 +
8
- Determine the name of the algorithm used in this topology.
 - Show the shortest path and the associated costs from Node 5 to the first five nodes visited (excluding itself). Show your work



- Tell how the link-state algorithm detects if it should send its LSP to a particular neighbor? 5
- In the distance vector algorithm there is no exchange of hello packets, state why? 5

- Q 4. a) 5
CO4



Create a static route on Router B for LAN C via the multi-access network

- Create a static route for LAN C on Router A with an administrative distance of 5 using S1/1 as the exit interface. If for some reason this link goes down, how will you handle the situation? Write the command for it. 4
+
4
- Writing the 'show ip route network 21.1.64.0' command on Router B gives the following output: 3
+
4

S 21.1.64.0/26 [1/0] via 112.23.224.162

State your reason why this way of static route is not recommended. Write how it should be changed to a more efficient static route.

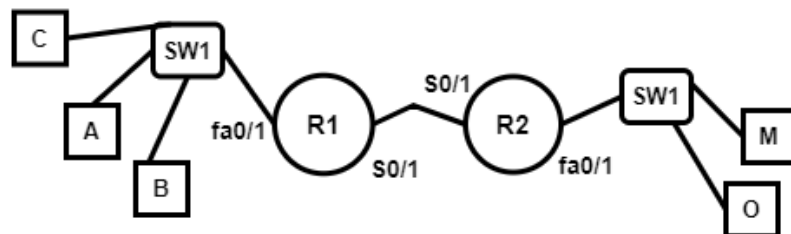
Q 5. a) There are no fragmentation and option fields in IPv6 headers. **State** how the IPv6 protocol of a router handles a packet that requires fragmentation. And also **state** how a router using IPv6 can add extra information. 5
+
4

b) IPv6 has no broadcast address. **State** how we can send broadcast packets in IPv6. 5

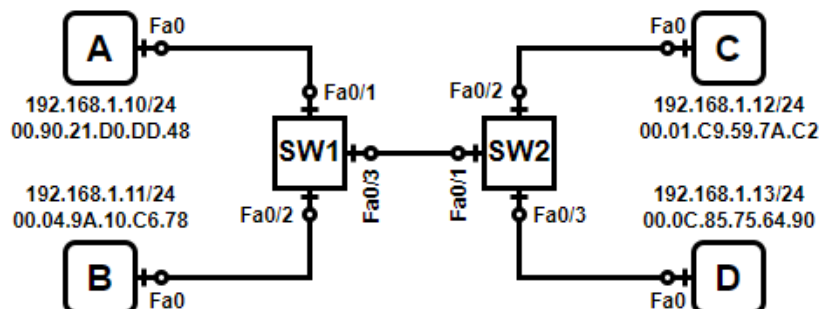
c) **Identify** in which type of dynamic IPv6 assignment method DAD is not required and why? 6

Q 6. a) **Specify** the two parts of a MAC address. **Identify** which bit of the MAC address signifies if it's a unicast or a multicast address. 4

b) Referring to the figure below, host A wants to communicate with host O. State if host A will ever find the MAC address of host O in its ARP table. Next, host A sends an ARP request for host C's MAC address, **stating** which devices will receive that ARP request and what they will do with that ARP request. 3
+
4



c) Referring to the figure on the right, the MAC address table of switch SW1 contains information of **host D & A**, while SW2 is empty. Now, **host A** sends a packet to **host D**. **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 =====