

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

Examination : Semester Final  
 Duration: **2 Hour 15 Minutes**

Semester: **Summer 2023**  
 Full Marks: 75

CSE421 / EEE465 : Computer Networks

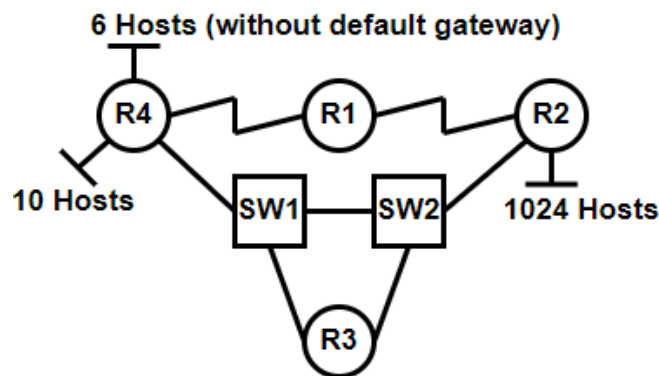
Answer **Sections A & B** as per instructions given. (**Pages: 3**)

Figures in the right margin indicate marks.

<b>Name:</b>	<b>ID:</b>	<b>Section:</b>
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**SECTION A [All questions of this section are MANDATORY]**

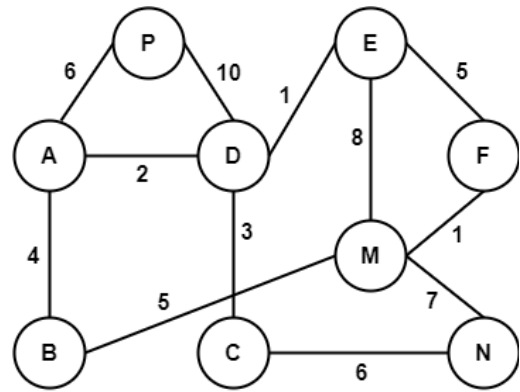
- Q 1. a)** Given an IP address of **13.124.146.43** with a subnet mask of **255.255.240.0** **2**  
**CO3**      1. **Identify** the network address **+**  
              2. **Identify** the broadcast address **3**
- b)** Using the network address of (a), use VLSM to **determine** the subnetwork addresses of the **10**  
**CO3** following topology.



- Q 2. a)** Given a packet containing data of **9600 bytes** and a header of size **56 bytes**, it needs to go **3**  
**CO3** through a link with an **MTU of X bytes**. It took **10 fragments** of equal size to transport the **+**  
 entire data packet. Assume the start byte number is 0. **1**  
     **I. Calculate** the packet size of each of the fragments. **+**  
     **II. Identify** the value of MTU **4**  
     **III. Calculate** the offset value of the 5th packet.
- b) CO2 Deduce** what disadvantage does **PING** have when compared to **TRACERT**? **3**
- c) CO2** You are invited to visit Square Head office to look at their network topology. To your surprise, **4**  
 Square also uses the same network address as BRAC University. The network address is **172.16.0.0/12**. You know, all organizations require unique IP addresses to access the Internet. How can Square Limited and BRAC University access the Internet with the same network address? **Explain.**

Q 3. a)  
CO3

	A	B	C	D	E	F	M	N	P
A	0	4	inf	2	inf	inf	inf	inf	6
B	4	0	inf	inf	inf	inf	5	inf	inf
C	inf	inf	0	3	inf	inf	inf	6	inf
D	2	inf	3	0	1	inf	inf	inf	10
E	inf	inf	inf	1	0	5	8	inf	inf
F	inf	inf	inf	inf	5	0	1	inf	inf
M	inf	5	inf	inf	8	1	0	7	inf
N	inf	inf	6	inf	inf	inf	7	0	inf
P	6	inf	inf	10	inf	inf	inf	inf	0



Consider the given topology, where the circles denote nodes/routers, and the numbers on the edges denote the respective cost of that edge. The entire topology counts hops to judge the shortest path. **Update** the cost table of **node M** once for all the remaining nodes using the above routing algorithm. Here, **node M** is not sending any routing table updates to node E and it is not receiving any updates from node F.

10

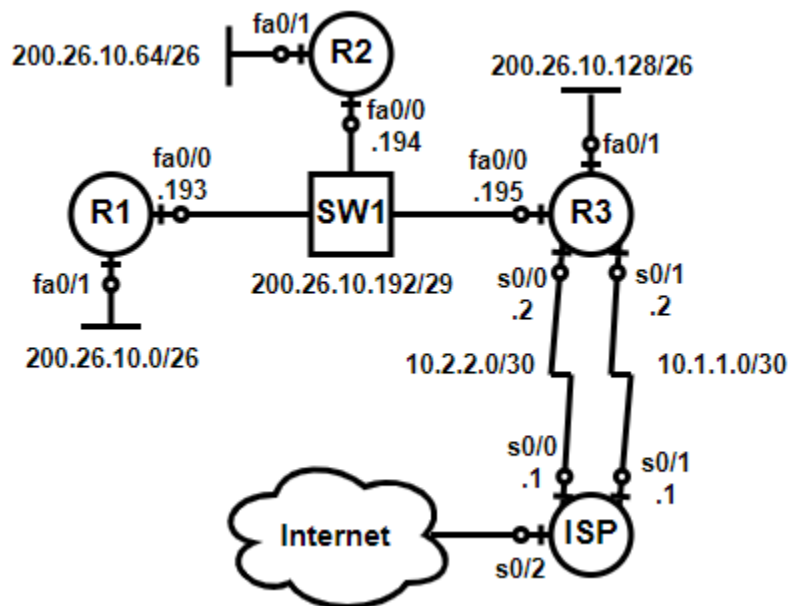
b) CO2 **Outline** how link-state routing protocol keeps track of neighbor routers.

5

END OF SECTION A

SECTION B [Answer ANY TWO out of THREE in this section]

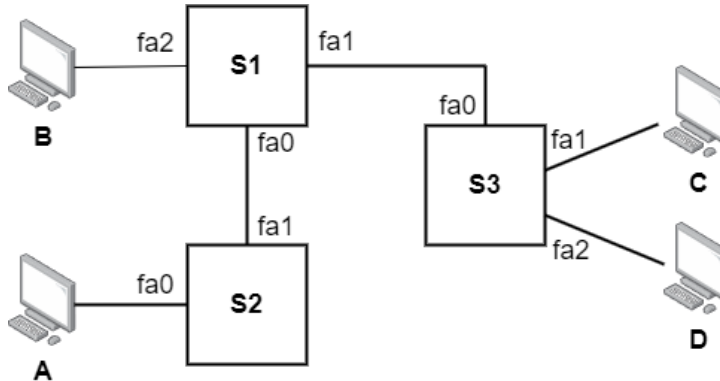
Q 4. a)  
CO3



2  
+  
3  
+  
1

Refer to the diagram above.

- I. Write the command required in R2 for a static route for the network 200.26.10.128/26.
- II. Write a summarized directly attached static route command in the ISP router for all the networks attached to routers R1, R2, and R3.
- III. Write a floating static route for the summarized static route in 4(a)(II).

- b) CO2 “The administrative distance of a floating static route can never be greater than the primary static route.” True or False? **Explain** briefly. 5
- c) CO2 **Deduce** static routes are more efficient than dynamic routes in which scenarios? 4
- Q 5. a) CO3 **Identify** the subnet ID and the MAC address from the following shortened IPv6 address 2000::1A3C:1F01:242:21FF: FEE3:101 6
- b) CO2 You are asked to implement a DHCP architecture to assign IPv6 addresses dynamically, along with keeping track of these address assignments. **Name** and **state** the steps to implement such a process. 5
- c) CO2 **Write** why did IPv6 eliminate the fragmentation fields from the IPv6 header. 4
- Q 6. a) CO3
- 
- Consider the following topology, where **S1**, **S2**, and **S3** are three switches and **A**, **B**, **C**, and **D** are host devices. All the switches are just turned on. Then, **Host A** sends a frame to **Host C** and gets a reply. **State** the current condition of all switches' MAC Address tables. *Drawing the tables is enough.* 6
- b) CO2 **Explain** briefly the statement – ‘MAC addresses are portable.’ Where do we assign MAC addresses usually? 3+  
2
- c) CO2 **Host A** in **Network A** wants to send a data packet to **Host B** in **Network B**. Deduce which device's MAC address will be put in the destination MAC address field of the data packet intended for **Host B**. Also state why. 4

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**END OF SECTION B**

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

*Why do network engineers prefer gardening? Because they have great subnet skills.*