B

BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination : Semester Final
Duration: **2 Hours 5 Minutes**

Semester: **Spring 2024**
Full Marks: 70

CSE421 / EEE465 : Computer Networks

Answer **Sections A, B and C** as per instructions given. (**Pages: 3**)

Figures in the right margin indicate marks.

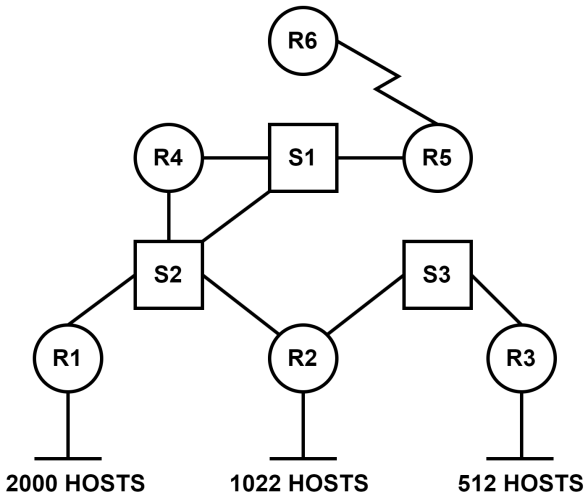
Name:	**ID:**	**Section:**

SECTION A [All questions of this section are **MANDATORY**] **- 40 MARKS**

Q1 Mahalabia Inc. needs to subnet the existing network (1.2.128.0/17) into smaller sub-networks, as given in the figure below. **3 + 12**

[CO3] **I.** **Determine** the maximum number of subnets you can create from the above-mentioned root network.

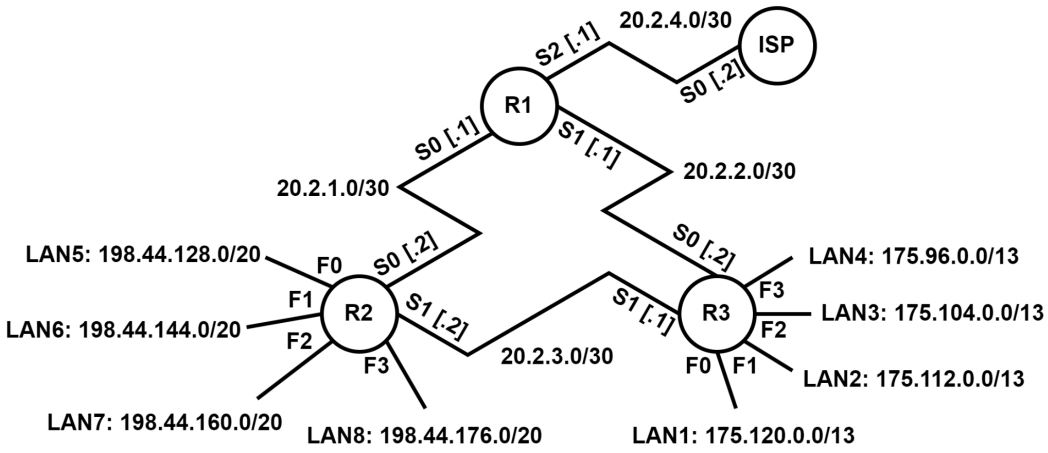
[CO3] **II.** Efficiently **calculate** the network address for all the sub-networks and draw the hierarchical tree.



Q2 Consider the following figure (next page), where R1-R3 and ISP are routers and the corresponding interfaces are mentioned beside them. The notation S0 [.1] denotes that S0 is the name of the interface and [.1] denotes the IP address. Answer the questions below: **6 + 4**

[CO3] **I.** **Calculate** the summarized network of all R3 LANs and then configure a summary static route in the router R1 for the calculated network

[CO3] **II.** **Write** a command in router R1 to configure a floating static route to LAN2 of R3, using an exit interface via router R2 with an AD of 50.

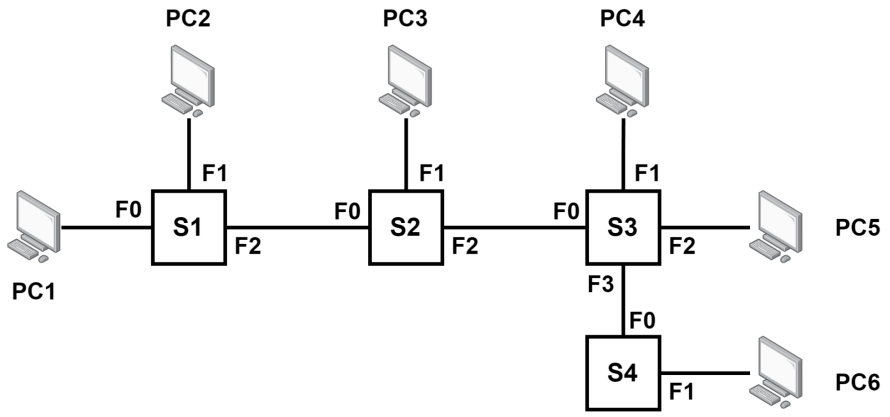


Q3	A router receives a packet containing 4560 bytes which includes 20 bytes of header. After looking at the IP header and consulting its routing table, the router knows that it needs to send the packet through its serial link, which has an MTU of 380 bytes.	**2 + 2 +**
[CO3]	**I. Calculate** the number of fragments that have been created from the original packet.	**1**
[CO3]	**II. Calculate** the fragment offset of the 4th fragment.	
[CO3]	**III. State** the MF bit of the 5th fragment.	
Q4 **[CO2]**	Dipu is trying to set up his new startup company's network, which consists of twenty devices, including a router connected to an ISP. He thought of cutting the cost of installing a DHCP server by sharing the DHCP server of his friend Zahin. Zahin works for another company with a DHCP server set up in the same building two floors down. However, to Dipu's surprise, his devices cannot receive any IPv4 configuration from the DHCP server. **Identify** the problem here and explain how it can be solved.	**6**
Q5 **[CO2]**	Dipu can only afford a single public IP address. So, the ISP allows only one device to access the Internet. **State** if this statement is true or false, and **explain** your answer.	**4**

END OF SECTION A

[CO3] **SECTION B** [Answer **ANY TWO out of THREE** in this section] **- 12 MARKS**

Q6	Refer to the figure in Q2. Assume all routers are running the Distance Vector Routing protocol. Through which interfaces will the router R2 send the routing updates periodically? **Explain** your answer.	**6**
Q7	Given your device has an IPv6 address of **FE80:0:0:B0B:980:FF:FE00::** which was generated using the EUI-64 protocol.	**4 + 2**
	I. Identify the MAC address of your device.	
	II. Identify the type of IPv6 address.	

Q8	 Suppose, the MAC Address table of switches S2 and S3 already contains the interface information of PC3 and PC5. At this moment, PC4 sends frames to PC3 and PC2. How is the sending of these two frames by switch S3 different? Consider that none of them replies to PC4. Now, **illustrate** the current state of the MAC Address tables of switches S3 and S2. [Mention the device name and the interface]	**4 + 2**

END OF SECTION B

[CO2] **SECTION C** [Answer **ANY THREE out of FIVE** in this section] **- 18 MARKS**

Q9	**What** type of attack can be used to stop a website from responding to any HTTP requests by using PING? **Explain** the process in brief.	**2 + 4**
Q10	Using the figure in Q8, an ARP request from PC1 is sent to find the MAC Address of PC5. **Determine** how the switches S1, S2 and S3 will forward this request. After receiving the ARP reply from PC5, **what** two functions will PC1 perform next?	**2 + 4**
Q11	A user's IPv6 packets are encapsulated within IPv4 packets while going from a source IPv6 network to the destination IPv6 network. Please **explain** why this is done and **state** the name of the process.	**4 + 2**
Q12	Given your MAC address is **98:CC:12:23:40:BB**. **I.** **Identify** if the address is a unicast or a multicast. **II.** **Discuss** why the MAC address is considered a flat address rather than a hierarchical address like an IPv4 address.	**2 + 4**
Q13	LSP is triggered only when there is a change in the topology. **Describe** how Distance Vector protocol handles any change in the topology.	**6**

END OF SECTION C

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

We like telling HTTP jokes because everyone GETs them.