

Reg. No.:

Name :

VIT<sup>®</sup>Vellore Institute of Technology  
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## Continuous Assessment Test II – October 2023

Programme	: B.Tech. (CSE)	Semester	: Fall'23-24
Course	: Computer Networks	Code	: BCSE308L
		Slot	: C1+TC1
Faculty	: Dr. Deepa Nivetika, Dr. Neelanarayanan V, Dr. Rajesh Kumar	Class Nbr	: CH2023240100901 CH2023240100902 CH2023240101180
Time	: 90 Minutes	Max. Marks	: 50

Answer ALL the questions

Q.No.	Sub. Sec.	Questions	Marks
1. ✓		<p>School of M &amp; M in Cambridge has bought five new servers. Their names and distances are configured as shown in the Fig 1 below. The network authorities have decided to run the Distance vector method for Routing between these servers. They expect your help to find the steps involved in the above-said method and to write routing tables for the various steps and iterations involved. With the help of the values provided by you, they can cross-verify the output of their implementation.</p> <p style="text-align: center;">Fig 1</p>	10
2	a. ✓ b. c.	<p>Identify standard of protocol that will use Point Coordination Function (PCF) and Distributed Coordination Function (DCF). [2 Marks]</p> <p>Describe the conditions when PCF or DCF will be used for communication between host computer and a network device. [4 Marks]</p> <p>Draw a diagram to show use of DCF for communication between a computer and a network device with constraint of some other device that may not be visible to the computer. Describe the details of diagram. [4 Marks]</p>	10



3.

a

A network engineer was trying to find the shortest path in the network provided below with the help of Dijkstra's algorithm. He generated an empty routing tree and seeks the help of an expert like you to fill up the nodes and distances. [5 Marks]

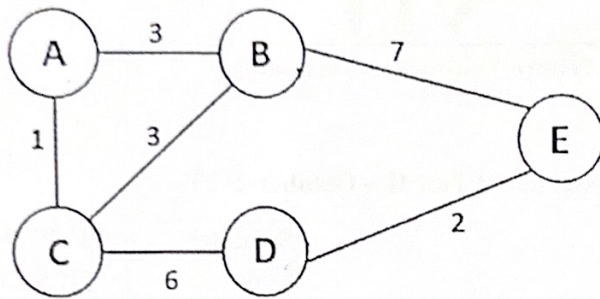


Fig 2: Network

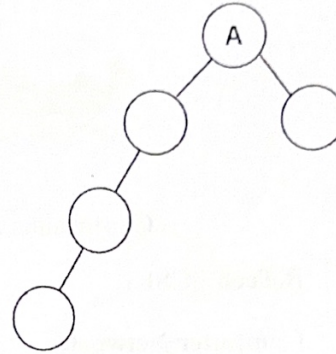


Fig 3: Empty Routing Tree

b

Later a node F has been added along with the network as shown in the figure below. This makes some changes in the tree. Can you draw the routing tree after the addition of node F. [5 Marks]

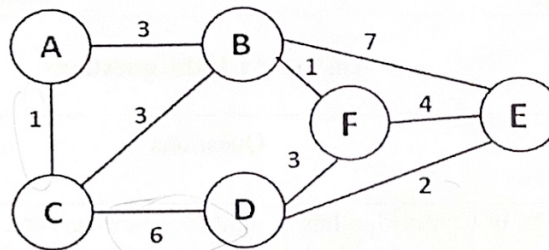


Fig 4 : Network with F node

4.

a

Suppose a router receives the below shown IPv4 packet and needs to forward it out on a link with 300 byte MTU. Mention the IP ID, Flags, Length, offset of the last fragment. [5 Marks]

IP ID	M F	D F	TT L	Length	Offset (in bytes/8 form)
15	0	0	10	1500	370

b

In an enterprise network that uses class-based address, a host is assigned **202.109.31.220** IP address.

a) What is the class of the above IP address? [1 Mark]

b) If the enterprise network is divided into **4 subnetworks**, then

a. What is the subnet mask for the above IP address? [2 Marks]

b. What is the subnetwork address to which the above IP address belongs to? [2 Marks]

5.

a

Consider the network topology shown in the below diagram comprising routers, switches and host computers. The figure also shows the IP address and MAC address assigned to various interfaces. The routing and ARP table are also shown for your reference. Identify the header fields: source MAC address, destination MAC address, source IP address and destination IP address of the datagram packet at time stamps t1 to t5. The time stamps represent the journey of an IP packet from the source host 192.168.1.2 to the destination host 192.168.2.2. [5 Marks]

10

10

10



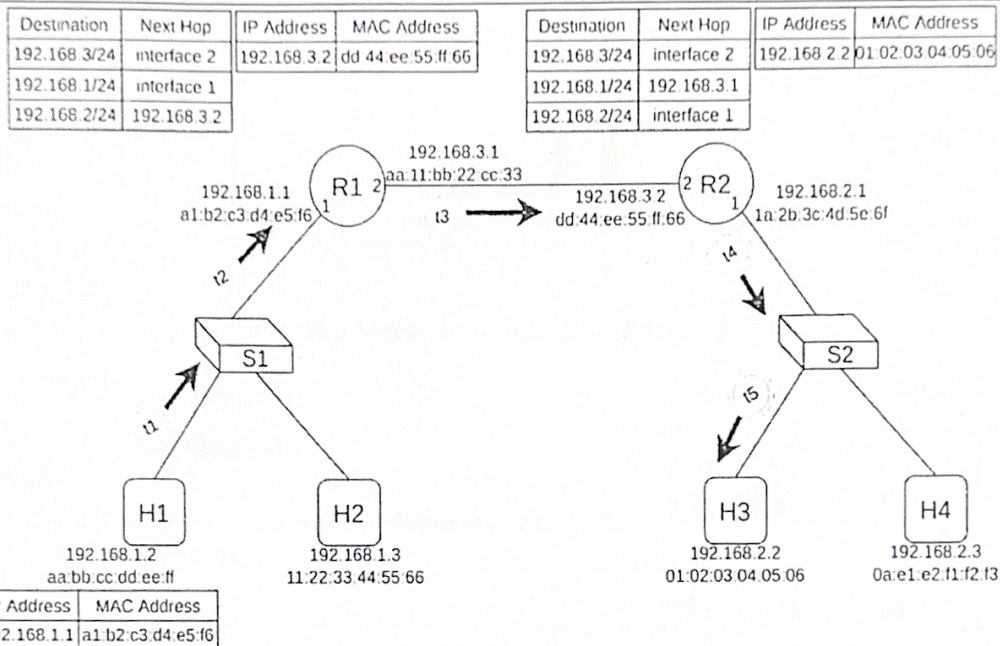


Fig 5: Network

Consider an edge router of a private network implementing Network Address and Port Translation and has the following NAT table entries.

WAN side address	LAN side address
202.38.16.7:6001	172.16.2.1:3650
202.38.16.7:6002	172.16.2.1:5114
202.38.16.7:6003	172.16.2.2:3535
202.38.16.7:6004	172.16.2.3:4125

- I. If the following IP packet from the public network – destined to a host in the internal private network – arrives at the NAT, then mention the header fields for the packet once it passes through the NAT and enters the private network. [2.5 Marks]

Source IP address	Source Port	Destination IP address	Destination Port
105.65.21.4	3111	202.38.16.7	6002

- II. If the following IP packet from the internal private network—destined to a host in the public network—arrives at the NAT, then mention the header fields for the packet once it passes through the NAT and enters the public network. [2.5 Marks]

Source IP address	Source Port	Destination IP address	Destination Port
172.16.2.2	3535	138.76.21.3	80

