Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Midterm Examination, *Spring 2023*

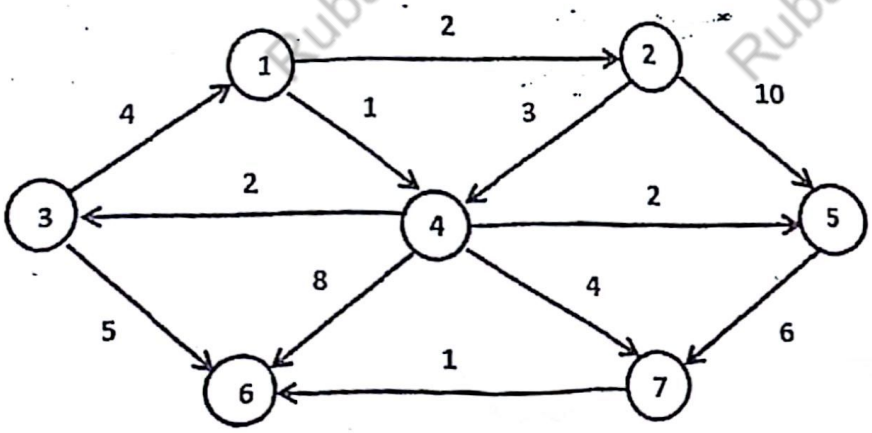
Course Code: CSE 313, Course Title: Computer Networks

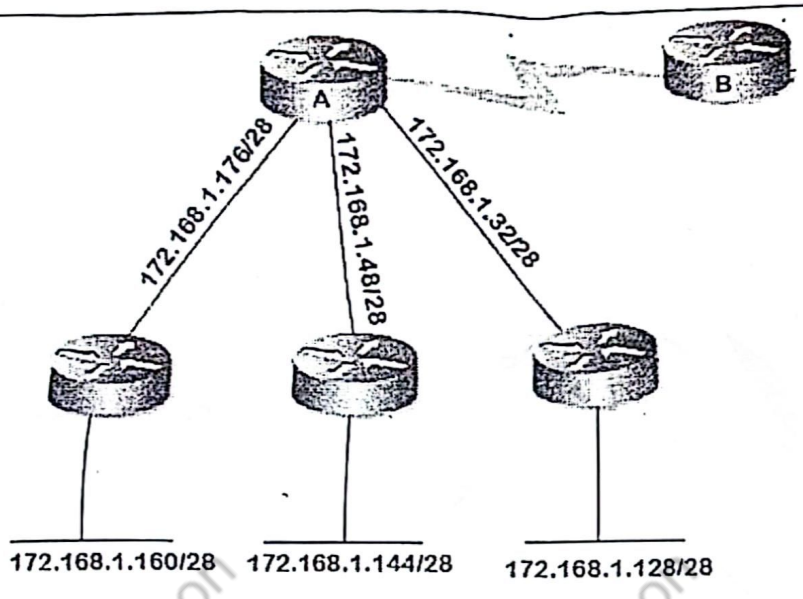
Level: 3 Term: 1 Batch: 58 and 59

Time: 1.5 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	Suppose, you are a network administrator of an emerging Network company. You have been given an IP address of a network 125.0.0.0. You need to divide this network for five departments of your organization to support 980, 490, 120, 25 and 5 hosts. **Identify** each subnetwork's subnet mask, network address, broadcast address, first valid host and last valid host address.	10	CO3
2.	Consider the following diagram with the indicated link cost. Use Link State routing algorithm to **discover** the shortest path from router 1 to all destinations. 	05	CO3
3.	From the following diagram, **determine** the Aggregated IP address, CIDR and mask from router A to router B.	05	CO2



4.	**Explain** the DNS name resolution techniques with suitable diagrams.	05	CO1

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Department of Computer Science and Engineering

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Midterm Examination, Fall 2022

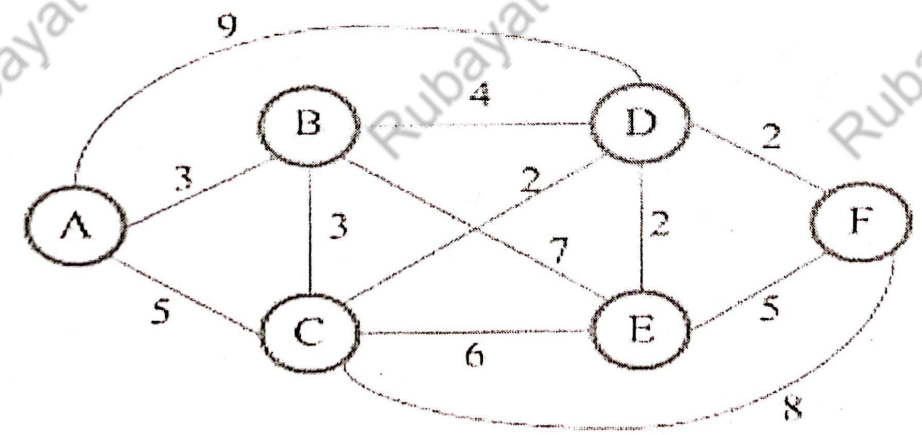
Course Code:CSE313, Course Title: Computer Networks

Level:3 Term: 1 Batch: 57

Time: 01:30 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

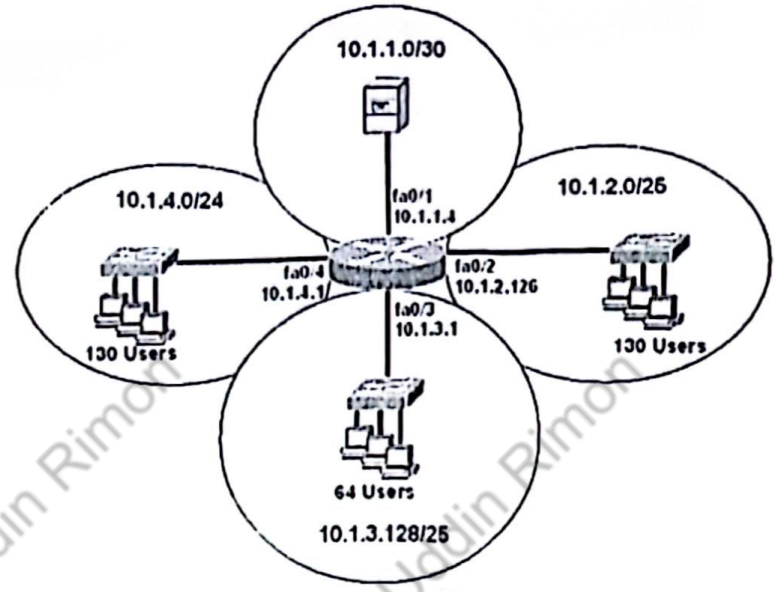
1.	An ISP provides a class A network of 110.0.0.0 to an enterprise that requires six networks to support 14, 80, 20, 30, 60, and 120 users. Identify the network mask that would be configured in each workstation and each subnet's network address, broadcast address, host number & 5th host address?	**10**	**CO3**
2.	There are a few subnets from 171.91.20.0/24 through 171.91.25.0/24. Identify the summarized subnet and mask address from the given subnet.	**5**	**CO3**
3.	Consider the following diagram with the indicated link cost. Use link state algorithm to discover the shortest path from node C.  	**5**	**CO2**
4.	What is DNS? Describe its working procedure with a scenario.	**5**	**CO1**

Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Midterm Examination Semester: Spring 2022
Course Code: CSE 313 (Day) Course Title: Computer Networks
Level: 3 Term: 1 Section: All

Time: 1.5 hours **Answer All the Following Questions** **Full Marks: 25**

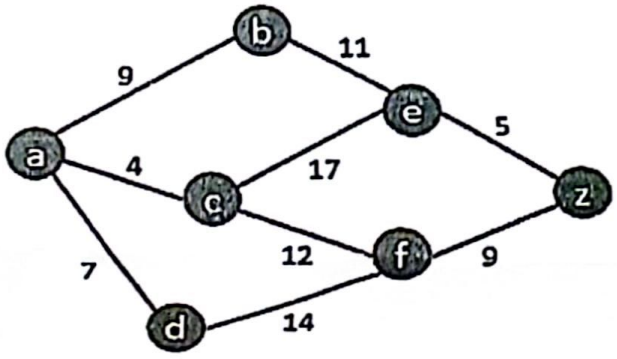
1. Check the following diagram and find error (if any). Provide suitable solution. 5



2. Mention why centralized DNS is not practically used? What are the advantages of an iterative query over recursive query in DNS? 5

3. a) Suppose you are the Network Administrator of Daffodil International University. You have given an IP address 173.10.0.0/20 and you need to create 5 usable subnets for CSE, SWE, MCT, GED and BBA departments. Where, it needs to have maximum 500 host addresses for CSE, 250 for SWE, 120 for MCT, 60 for GED and 50 for BBA department. Is it possible to assign the maximum number of hosts mentioned above for CSE, SWE, MCT, GED and BBA department? It yes, then explain the detail process. You need to mention the Network address, Broadcast address, First host address and Last host address for each department. 5

b) Calculate the shortest path from a to z using Link State Routing algorithm. Show the detail calculations. 5



c) An Organization is granted the block 111.0.0.0/8. The administrator wants to create 32 subnets. Consider "0" as First Subnet. 5

i. Find the subnet mask.
ii. Find the number of addresses in each subnet.
iii. Find the first and last host addresses in subnet 16.
iv. Find the Network and Broadcast address in subnet 32.

Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Midterm Exam Examination, Fall 2021 @ DIU Blended Learning Center

Course Code: CSE313 (Day), Course Title: Computer Networks

Level: 3 Term: 1 Section: All

Instructor: All Modality: Open Book Exam

Date: Saturday 13 November, 2021 Time: 01:30pm-04:00pm

Two and half hours (2:30), Marks: 25

Answer all of the following questions. Figures in the right-hand margin indicate full marks.

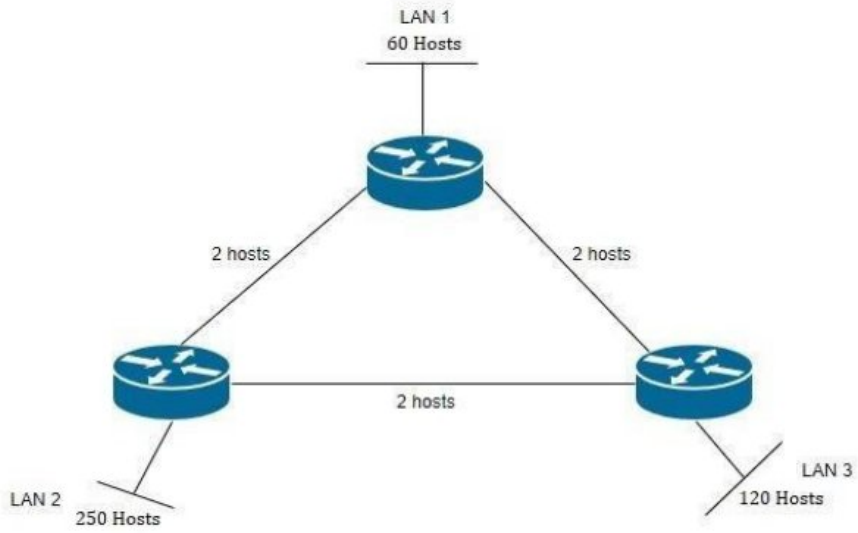
1. a) Classful vs Classless addressing; as a network administrator, which one do you prefer and why? **2**

b) Which two statements describe the IP address 10.16.3.65/23? Justify your answer. **3**
1. The subnet address is 10.16.3.0 255.255.254.0.
2. The lowest host address in the subnet is 10.16.2.1 255.255.254.0.
3. The last valid host address in the subnet is 10.16.2.254 255.255.254.0.
4. The broadcast address of the subnet is 10.16.3.255 255.255.254.0.

2. a) "SMTP is not used to receive emails" - justify the statement with proper clarifications **2**

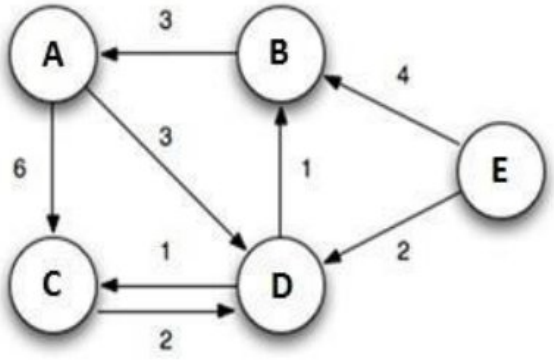
b) In order to deal with the issue of scale, the DNS uses a large number of servers, organized in a hierarchical fashion and distributed around the world. No single DNS server has all of the mappings for all of the hosts in the Internet. Instead, the mappings are distributed across the DNS servers. How the DNS servers are distributed and what are the reasons behind these mappings? **3**

3. a) An organization has been assigned the network address 110.0.0.0/10 and it plans to solve the following network sub-netting using VLSM. Solve this problem for that organization. **5**



b) What would be the Network Address, Broadcast Address, Valid IP addresses range, and Subnet Mask of 8th subnet of 192.168.10.0/28. The zero subnet should not be considered valid for this question. **5**

c) Differentiate between Delivery and Forwarding. Considering the following diagram show the operation of Dijkstra's (Link State) algorithm for computing the least cost path from E to all destinations. Also explicitly list all the shortest path routes from E to all destinations that are the result of the algorithm's computation. **5**



Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Midterm Examination, Spring 2021 @ DIU Blended Learning Center

Course Code: CSE 313 (Day), Course Title: Computer Networks

Level: 3 Term: 1 Section: G

Instructor: RAH Modality: Open Book Exam

Date: Sunday 7 March, 2021 Time: 09:00-11:30 am

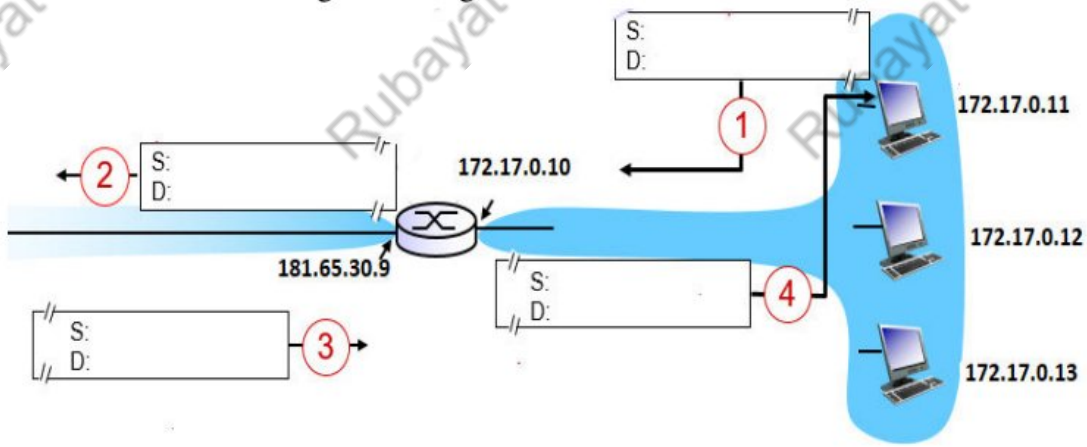
Two and half hours (2:30) to support online open/case study based assessment Marks: 25

Directions:

- **Students need to go through the CASE STUDY shown in this exam paper.**
- **Analyze and answer specific section based on your own thinking and work.**
- **Do not share as this will be treated as plagiarism by Blended Learning Center.**

1. a) A block of addresses is granted to a small organization. We know that one of the addresses is **115.71.52.75/26**. Find out the first address, last address and total number of addresses in that block. Show your detail calculations. **[2.5]**

b) Consider the following scenario. If the host with IP address **172.17.0.12** wants to send a packet to the IP address **138.56.27.7**, show the address translation process and translation table according to the diagram. **[2.5]**

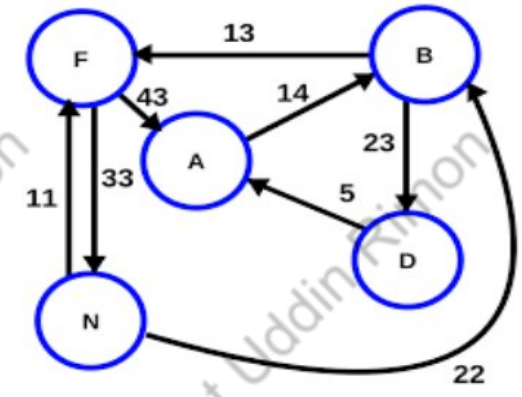


2. a) Suppose you are working in the XYZ company. Your company has a local DNS server for all computers in the organization. When you typed www.yahoo.com on the browser from your office, you can see the page of Yahoo. Suppose the local server is responsible for finding out all the name resolutions outside your network. Does this local server needs help of any other name servers? Try to explain the process of resolution with appropriate diagram that how you are able to see the page of Yahoo. **[3]**

b) Suppose you are using your Gmail account to send a message to your friend Jonny who is using his yahoo mail account and accesses his mail from the mail server using IMAP. Explain clearly with diagram that how the message gets from your PC to Jonny's PC and list the series of application-layer protocols that are used to move the message between the two hosts. **[2]**

3. a) Suppose you are a network administrator of ABC Network Company. You are currently working with an IP address 129.0.0.0 when a commercial customer requires different subnets for his three departments where X Department needs 905 hosts, Y Department needs 410 hosts and Z Department needs 112 hosts. Calculate Network and Broadcast addresses, First and Last valid hosts and subnet masks for each department assigned by you. Explain with detail calculations. **[7]**

b) Find out the shortest path from node **A** to all other destinations using Link State Routing algorithm based on the following directed weighted graph. Show your detail calculations. **[5]**



c) Find out the aggregate route, mask and CIDR of the following IP addresses: **[3]**

112.221.12.12 , 112.221.12.72 , 112.221.12.32 , 112.221.12.52 , 112.221.12.92

Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Midterm Examination Semester: Summer 2019
Course Code: CSE 313 (Day) Course Title: Computer Networks

Time: 1.5 hours **Full Marks: 25**

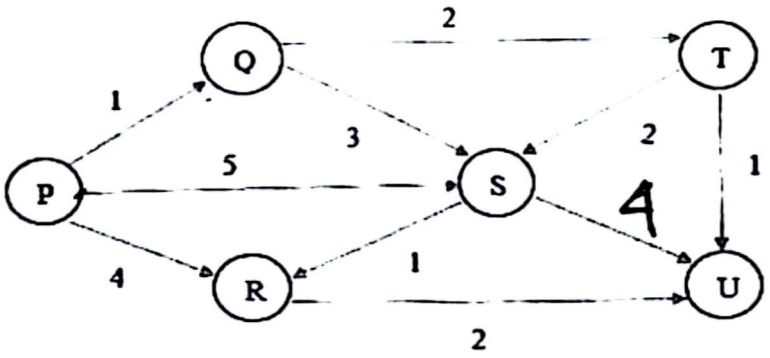
Part A: Answer the following questions in brief. 5*2=10

1. Mention why centralized DNS is not practically used?
2. What are the differences between circuit switching and packet switching technology?
3. Find the summarized IP address with subnet mask of the following IP addresses.
   172.16.72.0/24 172.16.75.0/24 172.16.77.0/24 172.16.79.0/24
4. What is NAT? How can NAT help in address depletion?
5. An organization is granted the block 10.0.0.0/8. The administrator wants to create 32 subnets.
   i. Find the Network address and Broadcast address in subnet 32
   ii. Find the First Host and Last Host address in subnet 10.

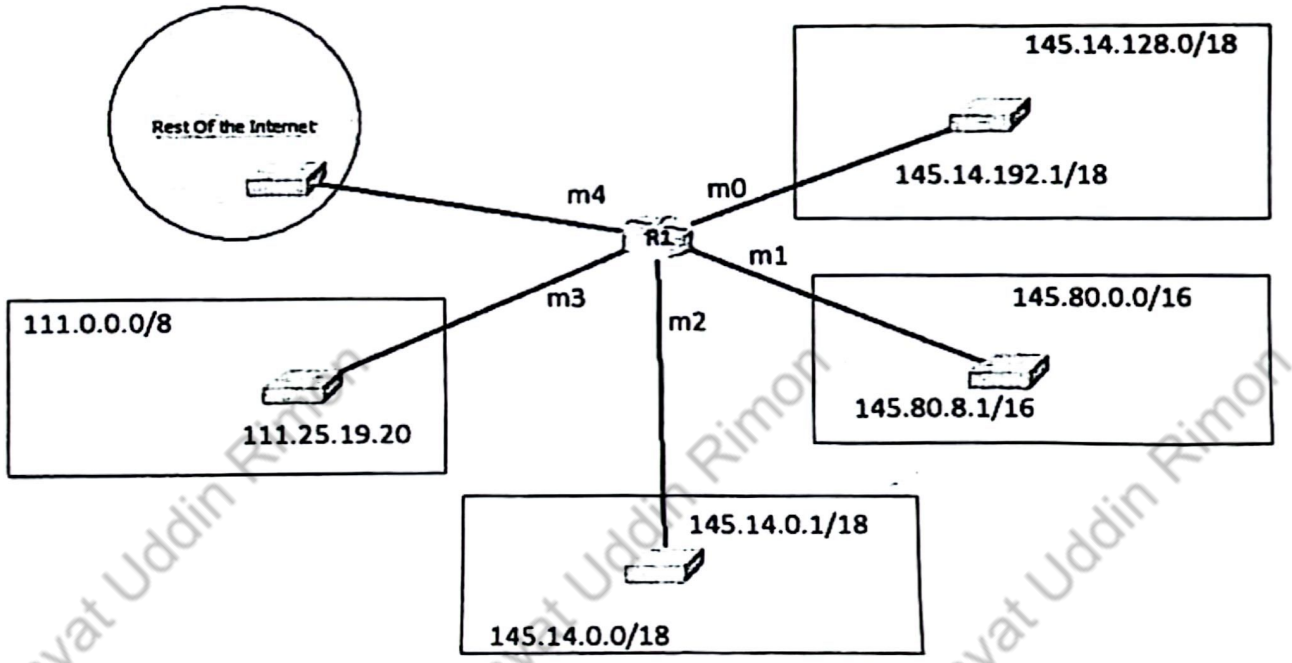
Part B: Answer ***ALL*** Questions 3*5=15

1. Suppose you are the Network Administrator of Daffodil International University. You have given an IP address 173.10.252.0/22 and you need to create 5 usable subnets for CSE, SWE, MCT, GED and BBA departments. Where, it needs to have maximum 500 host addresses for CSE, 250 for SWE, 120 for MCT, 60 for GED and 50 for BBA department. Is it possible to assign the maximum number of hosts mentioned above for CSE, SWE, MCT, GED and BBA department? It yes, then explain the detail process. You need to mention the Network address, Broadcast address, First host address and Last host address for each department.

2. Calculate the shortest path from P (root) to all destinations using Link State Routing algorithm. Show the detail calculations and the shortest path.



3. Show the forwarding process, if a packet arrives at router R1 in the following figure with a destination address 145.14.32.78



Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Midterm Examination Semester: Fall 2018
Course Code: CSE 313 (Day) Course Title: Computer Networks

Time: 1.5 hours **Full Marks: 25**

Part A: *Choose the correct options and defend your answer.* *5*2=10*

I. In a block, the prefix length is /15; what is the mask?
A) 255.254.0.0 B) 255.255.255.0 C) 255.255.255.128 D) none of them

II. What is the last address of a block of classless addresses if one of the addresses is 12.2.2.127/28
A) 12.2.2.16 B) 12.2.2.112 C) 12.2.2.127 D) none of them

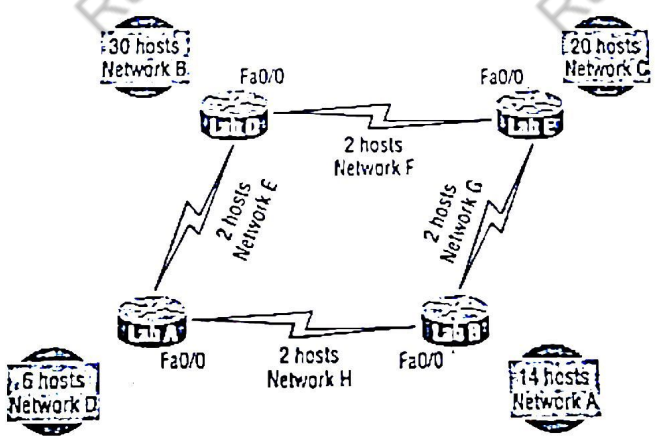
III. The routing processor of a router performs the _____ layer functions of the router.
A) Physical and data link B) network C) transport D) none of them

IV. NAT is used to translate what type of address?
A) Public to Private B) Private to Private C) Private to Public D) Public to Public

V. Which protocol provide push services?
A) HTTP B) SMTP C) IMAP D) POP

Part B: Answer ***ALL*** Questions *5*3=15*

1. a) As an administrator you are designing a network with following structure. Requirements of each department and nodes are mention in the image. The IP that you are planning to use in 202.168.20.0/24. According to the plan, you decided to go for eight subnets. Write down VLSM IP of range of all the subnets along with their network and broadcast IP. 3

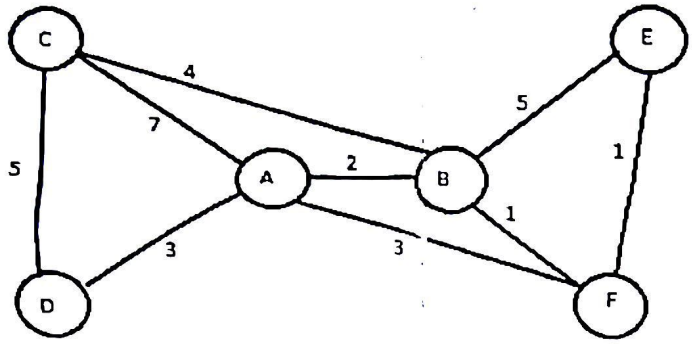


b) Find the most appropriate summarization of the following networks. 2

172.1.4.0/25
172.1.4.128/25
172.1.5.0/24
172.1.6.0/24
172.1.7.0/24

2. a) Distinguish between Iterated query and Recursive query of DNS name resolution with diagram. What are the most common DNS attacks? 2

b) Consider the following figure. Show the operation of Dijkstra's (Link state) algorithm for computing the least cost path from **B** to all directions and also draw the routine table for the root. 3



3. a) Show the shortest from of the following addresses. 1

2340:1111:119A:A000:0000: 0000:0AB0:0000
0000:00AA:1111:0000:0000:0000:119A:A231
19BC:0000:0F00:F000:0000:0000:0000:0000
00EF:1100:1DB1:0000:0D00:1289:0000:31AC

b) Let a block of address is assigned to an organization. If you know one of the addresses is 10.11.12.13/20, find the followings. 2

(i) The first and last usable address.
(ii) Broadcast address.
(iii) Block size of the network.

c) Why we need to use NAT? Explain with example. 2

Daffodil International University
Department of Computer Science and Engineering
Faculty of Science and Information Technology
Mid Term Examination, Semester: Summer -2018

Course Code: CSE 313 **Course Title: Computer Networks**
Section: All **Course Teacher: All**

Time:01:30 Hours **Full Marks: 25**

Answer any five questions from the followings

Q1. a. We know there are two fundamental approaches for moving data through a network of links and switches: **circuit switching** and **packet switching**.

I. Which switching allows more users to use the network? 0.5+
II. In which switching less congestion can happen? 0.5+
III. What is the role of output queue in packet switching? 1+
IV. When circuit switching is used, what could be the number of users that is supported by the connection? 1

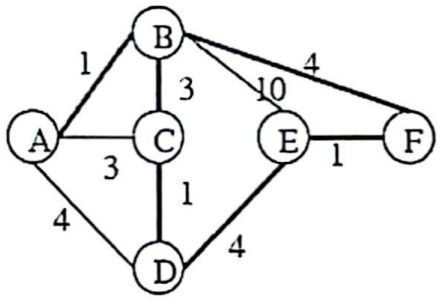
b. The figure below shows a network path connecting a server to a client. 2

What is the propagation delay for a packet going from the server to the client (you may assume that the speed of light is 200,000 km/s)?

Q2. a. Distinguish between shared-tree and source-based tree in multi-cast routing. 3

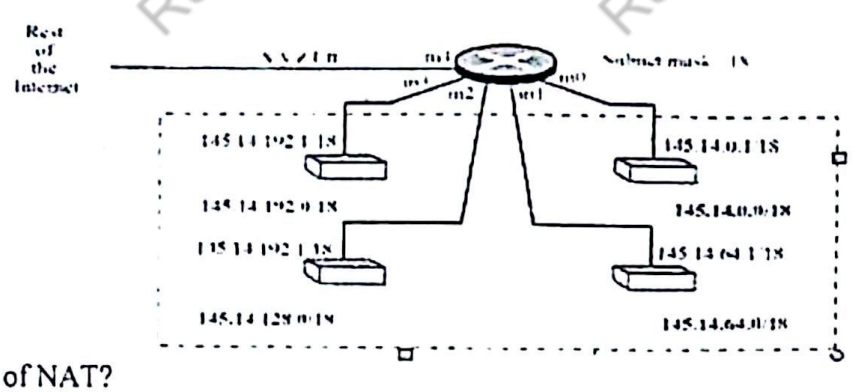
b. What is the difference between routing and forwarding? 2

Q3. a. Consider the network shown below. Show the operation of Dijkstra's (Link State) algorithm for computing the least cost path from F (the rightmost node in the figure below) to all destinations. Also explicitly list all the shortest path routes from F to all destinations that are the result of the algorithm's computation. 4



b. Compare and contrast the IPv4 and the IPv6 header fields. Do they have any fields in common? 1

Q4. a. In the above figure Router receives a packet with destination address **145.14.32.78**. Show how the packet is forwarded. 4

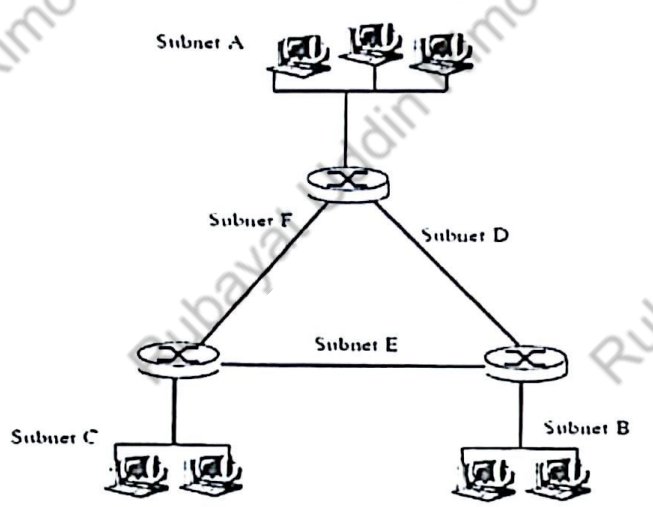


b. What is the use of NAT? 1

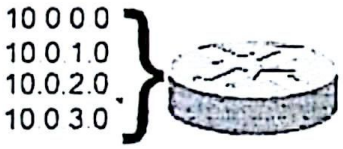
Q5. a. Consider the following topology. Assign network addresses to each of these 6 subnets, with the following constraints: 4

- All addresses must be allocated from 182.97.0.0
- Subnet A should have enough addresses to support 250 interfaces
- Subnet B should have enough addresses to support 120 interfaces
- Subnet C should have enough addresses to support 120 interfaces
- Of course, subnets D, E and F should each be able to support 2 interfaces

Provide three network addresses (of the form a.b.c.d/x) that satisfy these constraints.



b. What is the most appropriate summarization for these routes? 1



Q6. a. Let an ISP is assigned an address block, and consider one of the address from that block is 190.69.0.0 /26. Subnet the network so that each subnet has at least 50 hosts. (Host IP loss should be as minimum as possible) 4

a) How many subnets?
b) First, Last host address of 1000th subnetwork?
c) 30th host address of the 60th subnetwork?
d) Unnecessary Host address in the subnet
e) How many Host address losses for subnetting?

b. What information can a DHCP server provide to a host? 1