Daffodil International University
Department of Computer Science and Engineering
Faculty of Science and Information Technology
Midterm examination, Semester: Fall 2017

Course Code: CSE 313

Course Title: Computer Networks

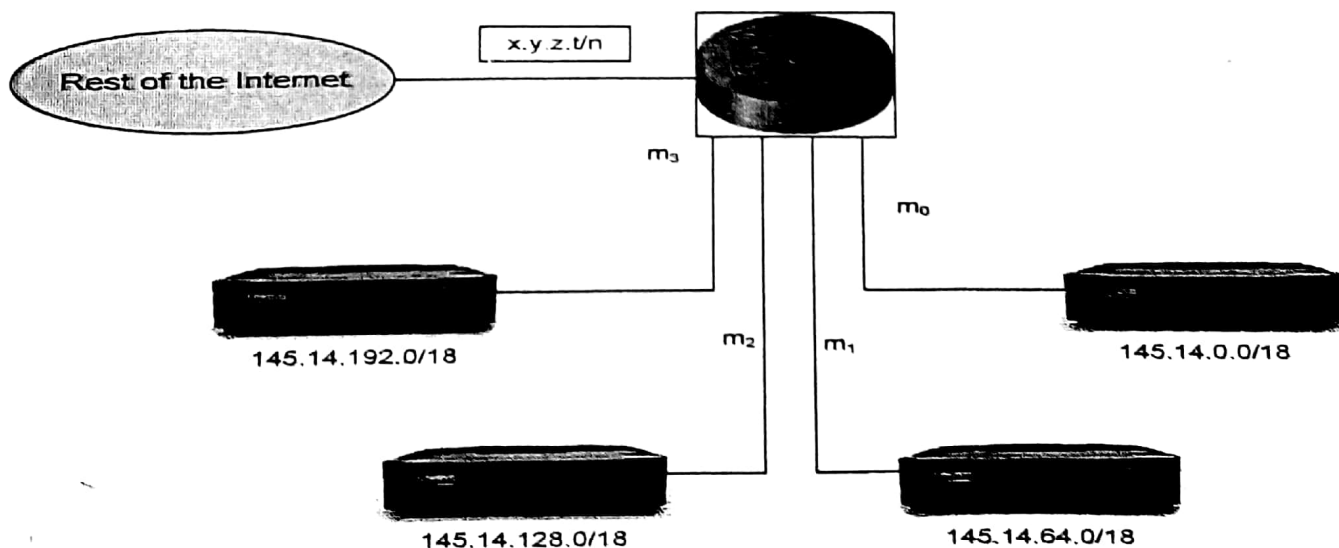Section: ALL

Course Teacher: ALL


Time: 1.5 hours

Total Marks: 25

Answer any five from the following questions

1. a. You work for a large communications corporation named Mayami Comm which has been **3** assigned a Class A network address. Currently, the company has 1,000 subnets in offices around the world. You want to add 100 new subnets over the next three years, and you want to allow for the largest possible number of host addresses per subnet. Which subnet mask would you choose? Describe the process and also mention first two and last two subnets of the network.

b. What four pieces of information does a DHCP client obtain from the DHCP server after a successful communication between the two? What are the destination IP and MAC address **2** in the discover request sent by the DHCP client?

2. a. If there are N routers from source to destination, what is the total end to end delay in **2.5** sending packet P, where L is the number of bits in the packet and R is the transmission rate?

b. Consider an application that transmits data at a steady rate (for example the sender **2.5** generates an N-bit unit of data every K time units, where K is small and fixed). Also, when such an application starts, it will continue running for a relatively long period of time and requires a dedicated path. Would a packet-switched network or a circuit-switched network be more appropriate for this application? Why?

3. a. In the above figure, the router is connected with different network and the network **3** addresses are given in the figure. Router receives a packet with destination address **145.14.32.78**. Show how the packet is forwarded.


```
                        x.y.z.t/n
  ┌─────────────────┐   ┌────────────────┐
  │ Rest of the Internet │─────│  (router)  │
  └─────────────────┘                 │
                                    m3 │  m0
            ┌──────────────┐           │        ┌──────────────┐
            │              │           │        │              │
            145.14.192.0/18   m2   m1         145.14.0.0/18

            ┌──────────────┐           ┌──────────────┐
            145.14.128.0/18            145.14.64.0/18
```

b. Suppose you have five PCs in your network. Also suppose that your ISP dynamically **2** assigns your connected devices one IP address. How are IP addresses assigned to the five PCs? Does this use NAT? Why or why not?

4. Suppose you are a network administrator of a company. You have a IP address 192.168.1.0. You have to assign networks according to the following requirements.
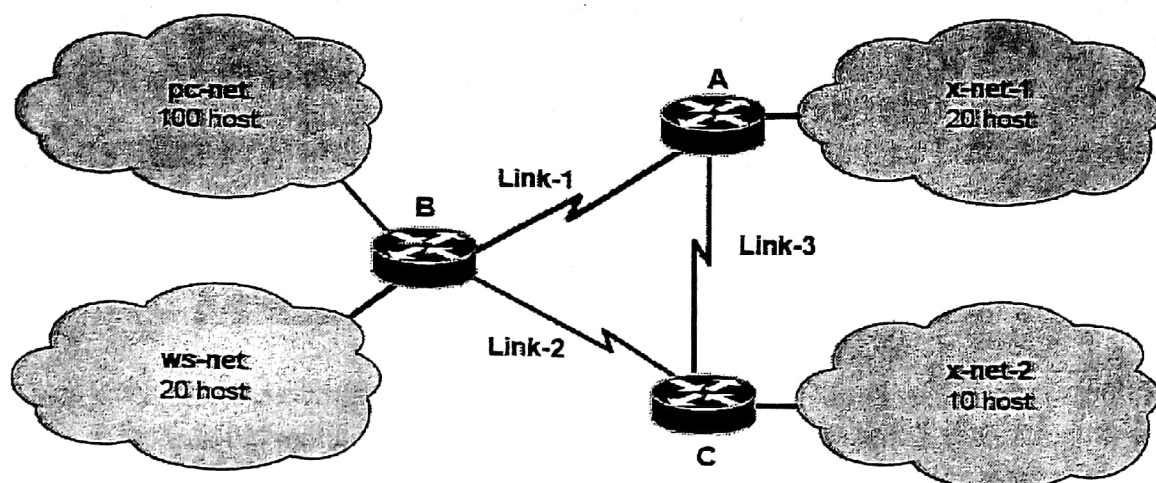
Show the Distribution table for the solution.

5. a. Suppose an institution is needed to transit from IPv4 to IPv6. What are the basic methods **2.5** they can use for this transition? Explain briefly.

b. If the four networks of customer A, B, C and D are summarized by ISP1, then what will be the summarized address?

2.5
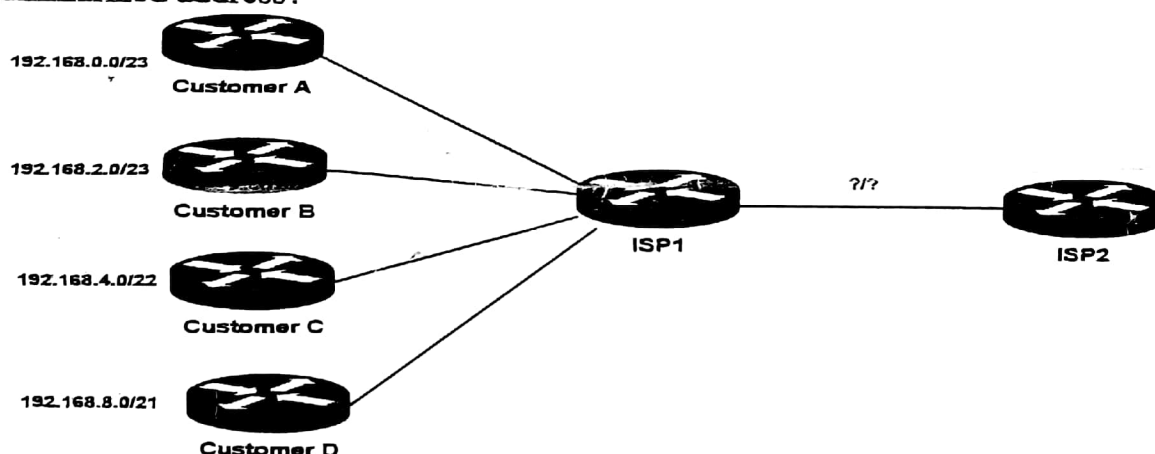
6. Use Dijkstra's all shortest paths algorithm to determine the shortest paths to node A. Record **5** the order in which the nodes are made permanent along with the next hop and the distance to the destination.