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B.Sc. Eng. CSE 8th Semester 29 August 2019 (Morning)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

MID SEMESTER EXAMINATION **SUMMER SEMESTER, 2018-2019**

DURATION: 1 Hour 30 Minutes **FULL MARKS: 75**

CSE 4839: Internetworking Protocols

Programmable calculators are not allowed. Do not write anything on the question paper.

There are **4 (four)** questions. Answer any **3 (three)** of them.

Figures in the right margin indicate marks.

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1. a) What is the difference between routing and forwarding? 5
   b) Write short note on forwarding process in a router when used in following networks, 9
      i. *Connection less Packet Switched Network*
      ii. *Virtual-circuit network*
   c) Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates R1 = 500 kbps, R2 = 2 Mbps, and R3 = 1 Mbps. 7
      i. Assuming no other traffic in the network, what is the throughput for the file transfer?
      ii. Suppose the file is 4 million bytes. Roughly how long will it take to transfer the file to Host B?
   d) What is the key difference between a tier-1 and tier-2 ISP? 4

2. a) How does a newly arriving host in a subnet get an IP address automatically? Describe the procedure with appropriate diagram. 7
   b) An organization is granted the block 130.56.0.0/16. The administrator wants to create total of 1024 subnets. 8
      i. Find the subnet masks.
      ii. Find the number of address in each subnet.
      iii. Find the first and last address in the first subnet.
   c) Consider the network shown in Figure 1, and assume that each node initially knows the costs to each of its neighbors. Consider the distance-vector algorithm and show the distance table entries at node *z*. 5

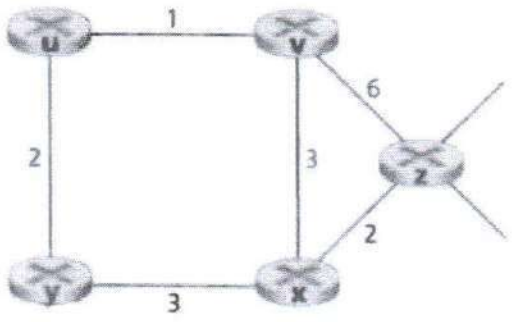

Figure 1: network for Question 2.(c)

   d) Describe the role of Internet Group Management Protocol (IGMP) and multicast routing protocol in multicast routing. 5

3. a) Suppose you purchased a wireless router and connected it to your cable modem. Also that your ISP dynamically assigns your connected device (that is, your wireless router) one IP address. Also suppose that you have five PCs at home that use 802.11 to wirelessly connect to your wireless router. How are IP addresses assigned to the five PCs? Does the wireless router use NAT? Why or why not? 7
   b) Compare and contrast the delays in connectionless and connection-oriented services. 6

c) A multicast address for a group is 232.24.60.9. What is its 48-bit Ethernet address for a LAN using TCP/IP? 6

d) Does Reverse Path Broadcasting (RPB) in Distance Vector Multicast Routing Protocol (DVMRP) actually create a shortest path tree? Explain. What are the leaves of the tree? 6

4. a) Consider an autonomous system named *AS1*, where *RIP* is utilized as its interior routing protocol. The routing table in a particular router *R1* of *AS1* has 20 entries. It does not receive information about five routers for 150s. How many *RIP timers* are running at this time? 8

b) Briefly describe the services provided by Network Layer at the source computer. 8

c) A router *D* using *RIP* (*Routing Information Protocol*) has the routing table shown in Table 1. 9

Table 1: Routing table for router *D* in Question 4. (c)

Destination	*Cost*	*Next Router*
Net1	4	*B*
Net2	2	*C*
Net3	1	*F*
Net4	5	*G*

i. Show the RIP response message sent by this router.

ii. Consider router *D* receives a RIP response message from router *C*, which is summarized as: (Net1, 2), (Net2, 1), (Net3, 3), (Net4, 7).
Show the updated routing table for router *D*.