3B. A network with one primary and four secondary stations uses polling. The size of a data frame is 1000 bytes. The size of the poll, ACK, and NAK frames are 32 bytes each. Each station has 5 frames to send. How many total bytes are exchanged if a station can send only one frame in response to a poll? **3**

3C. Consider the bridged network given in **Fig. Q.3C.** Show the stepwise building of forwarding table for the bridge B1, B2, B3 when packet exchange occurs in the order as given below.

a) X sends to Q
b) Z sends to R
c) P sends to B
d) Y sends to X
e) Z sends to P

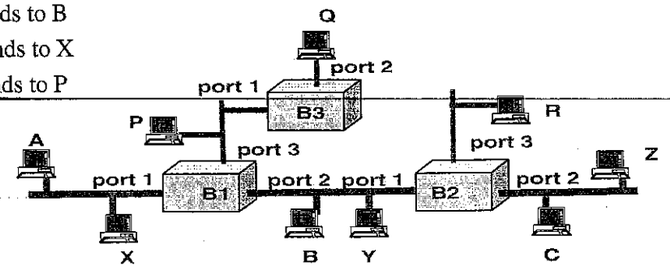

Fig. Q.3C. **2**

4A. Consider the network given in **Fig. Q.4A.** Assume that a packet destined for router R5 has arrived at router, R1. Apply Dijkstra's algorithm to design the shortest path tree with R1 as the root node. Construct the routing table for R1 from the shortest path tree.

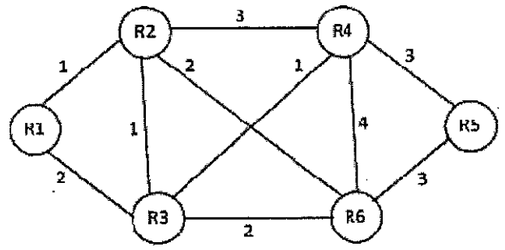

Fig. Q.4A. **5**

4B. A host with IP address 172.48.2.12 and Ethernet physical address 23:45:67:AB:12:CD has a packet to send another host with IP address 172.48.7.10 and Ethernet physical address A1:B2: A2:5E:77:CD (which is unknown to the first host). The 2 hosts are on the same Ethernet network. Show the entries in ARP request and reply packets encapsulated in Ethernet frames. **3**

4C. What is the count to infinity problem in Distance Vector Routing? **2**

5A. A host sends five packets and receives three acknowledgments. The time is shown as hour: minute: seconds.

a) Segment 1 was sent at 0:0:00.
b) Segment 2 was sent at 0:0:05.
c) ACK for segments 1 and 2 received at 0:0:07.
d) Segment 3 was sent at 0:0:20.
e) Segment 4 was sent at 0:0:22.
f) Segment 5 was sent at 0:0:27.
g) ACK for segments 1 and 2 received at 0:0:45.
h) ACK for segment 3 received at 0:0:65.

Calculate the values of RTT_M, RTT_S, RTT_D, and RTO if the original RTO is 6 seconds. **5**

5B. What are the different ICMP error messages? What are the 4 cases where no ICMP messages will be generated? **3**

5C. Why are BGP sessions sometimes referred as semi-permanent connections? **2**

Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

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IV SEMESTER B.TECH. (INFORMATION TECHNOLOGY)

MAKE UP EXAMINATIONS, JUNE 2018

SUBJECT: COMPUTER NETWORKS [ICT 2201]

REVISED CREDIT SYSTEM
(12 / 06 / 2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data, if any, may be suitably assumed.

1A. Suppose a Transport Layer data of 4200 Bytes is passed to the Network Layer for delivery across 2 networks of the internet, from source host, A to destination host, B. Assume that host A is connected to host B through router, R1. The first network (from host A to router R1) has a MTU of 1500 Bytes and the second network (from router R1 to host B) has a MTU of 785 Bytes. If all the fragments reach safely at the destination, show the offset and flag values for each of the fragments. Assume all IP headers are 20 Bytes. **5**

1B. Describe the frame transmission procedure adopted in ALOHA & CSMA/CD. Compare the frame delivery assurance methods in both. **3**

1C. Differentiate between Multicasting and Multiple Unicasting. **2**

2A. An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to customers as follows:

a) The first group has 200 medium-size businesses; each need approximately 128 addresses.

b) The second group has 400 small businesses; each need approximately 16 addresses.

c) The third group has 2000 households; each need approximately 4 addresses.

Design the sub-blocks and give the slash notation for each sub-block. **5**

2B. What is persistence timer in TCP? Explain its role in window shutdown. **3**

2C. What are the advantages and disadvantages of ring topology? **2**

3A. Elucidate the two traffic shaping algorithms. Mention four points to compare Leaky Bucket algorithm and Token Bucket algorithm. **5**