Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

IV SEMESTER B.TECH. (COMPUTER AND COMMUNICATION ENGINEERING)

END SEMESTER MAKE-UP EXAMINATIONS, JUNE 2019

SUBJECT: TCP/IP PROTOCOL SUITE [ICT 2254]

REVISED CREDIT SYSTEM

(19/06/2019)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Why do you need layered architecture for network/data communication? How it is achieved in OSI reference model? **5**

1B. Why does CSMA/CD fail to detect the collision in the wireless LAN? How can it handle the collision issues? **3**

1C. What are the different types of ICMP error reporting messages? **2**

2A. An organization is granted a block of addresses with the beginning address 180.202.0.0/16. Explain how the addresses are allotted for each subnet that are listed below. Show the first and last address of all the subnets and specify the range of unused addresses. **5**

i. Three subnets with 2000 addresses each
ii. Two subnets with 4000 addresses each
iii. Five subnets with 1000 addresses each
iv. Two subnets with 250 addresses each

2B. Explain the QoS parameters used for checking the quality of data communication. **3**

2C. How does ring topology control the channel access? Highlight the advantages of ring topology over other topologies. **2**

3A. A host with IP address 130.23.43.20 and physical address B2:34:55:10:22:10 has a packet to send to another host with IP address 130.23.43.25 and physical address A4:6E:F4:59:83:AB. The two hosts are on the same Ethernet network. Show the ARP request and reply packets encapsulated in Ethernet frames. **5**

3B. What are the limitations of one global address and pool of global address forms of NAT table? **3**

3C. Show a congestion control diagram using the following scenario. Assume a maximum window size of 64 segments. **2**

i. Three duplicate ACKs are received after the fourth RTT.
ii. A time-out occurs after the sixth RTT.

4A. How does TCP send acknowledgements? What are the rules for acknowledging a packet? **5**

4B. Explain QoS parameters used for checking the quality of data communication. **3**

Create routing table for the router R1 for the network given in Figure Q.4B. Also show the forwarding process if a packet arrives at R1 in Figure Q.4B with the destination address 201.4.30.70 and 201.4.23.0.

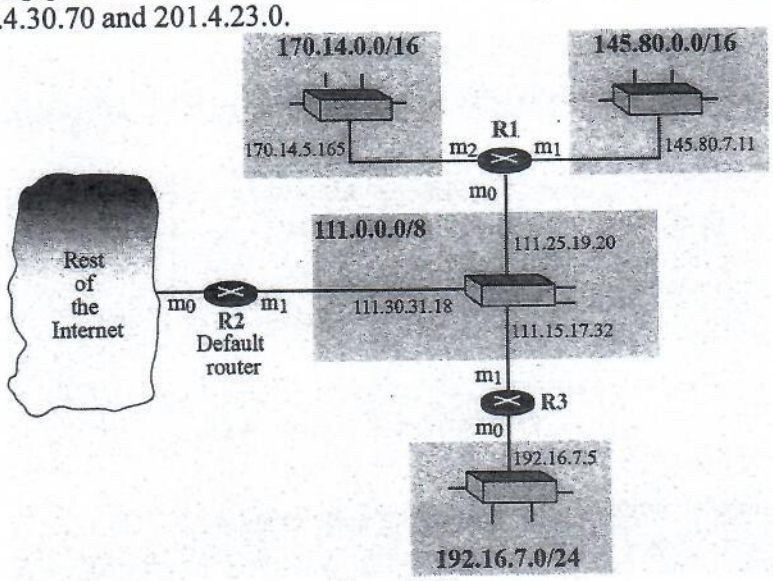

Figure Q.4B

4C. Explain DHCP operations in the following scenarios **2**

i. Both client and server are in the same network

ii. Client and server are in the different network

5A. Calculate the checksum for following IP packet. Also show the entries of an UDP pseudoheader, if UDP is using following IP packet for encapsulation. **5**

4	5	0	28
1		0	0
4		17	0
10.12.14.5			
12.6.7.9			
T	E	S	T

5B. In a TCP connection, the initial sequence number at the client site is 3000. The client opens the connection, sends only one segment carrying 2000 bytes of data and closes the connection. What is the value of the sequence number in each of the segments sent by the client? **3**

i. The SYN segment 3000

ii. The data segment

iii. The FIN segment

5C. What are the different types of timers that are used in RIP? **2**