Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institute of Manipal Academy of Higher Education

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

MAKEUP EXAMINATIONS, JUNE 2018

SUBJECT: TCP/IP PROTOCOL SUITE [ICT 2254]

REVISED CREDIT SYSTEM
(23/06/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. An ISP is granted a block of addresses staring with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows. **5**

i. The first group has 200 medium size business, each needs approximately 128 addresses.
ii. The second group has 400 small business each needs approximately 16 addresses.
iii. The third group has 2000 households, each needs 4 addresses.

Design the sub block and give slash notation for each sub block. Find out how many addresses are still available after these allocations.

1B. Two networks each provide reliable connection-oriented service. One of them offers a reliable byte stream and the other offers a reliable message stream. Are these identical? If so, why is the distinction made? If not, give an example of how they differ. **3**

1C. Distinguish between BSS and ESS in Wireless LANs. **2**

2A. Suppose that host A is connected to a router R1, R1 is connected to another router, R2, and R2 is connected to host B. Suppose that a TCP message that contains 800 bytes of data and 20 bytes of TCP header is passed to the IP code at host A for delivery to B. Show the Total length, Identification, DF, MF, and Fragment offset fields of the IP header in each packet transmitted over the three links. Assume that link A-R1 can support a maximum frame size of 1024 byte including a 14-byte frame header, link R1-R2 can support a maximum frame size of 512 bytes, including an 8-byte frame header, and link R2-B can support a maximum frame size of 512 bytes including a 12-byte frame header. **5**

2B. With a flow diagram explain the working of CSMA/CA. Where is it used? **3**

2C. A 100-byte message is sent through a private internet using the TCP/IP protocol suite. If the protocol adds a 10-byte header at each layer, what is the efficiency of the system? **2**

3A. Suppose you want to send a file of size 255,000 over a 2 Mbps link using TCP. The maximum segment size (MSS), which represents the size of TCP payload, is 1,000 bytes. Two-way propagation delay between the source and the destination is 10 [msec]. TCP Threshold = 130 packets. **5**

How long will it take to transmit the given file, from the start to the end of TCP transmission?

3B. Consider the following IP header (hexadecimal format) from an IP packet received at destination, in which the checksum is set to 0: **3**

4500 003C 1C46 4006 0000 AC10 0A63 AC10 0A0C

Calculate the checksum value (hexadecimal format) at the destination.

3C. Distinguish between two level addresses and three level addresses w.r.t. IP addresses. **2**

4A. Suppose that the five measured SampleRTT values are 106ms, 120ms, 140ms, 90ms, and 115ms. Compute the EstimatedRTT after each of these SampleRTT values is obtained, using a value of alpha = 0.125 and assuming that the value of EstimatedRTT was 100ms just before the first of these 5 samples were obtained. Compute also the DevRTT after each sample is obtained, assuming a value of beta = 0.25 and assuming the value of DevRTT was 5ms just before the first of these five samples was obtained. Last, Compute the TCP TimeoutInterval after each of these samples is obtained. **5**

4B. With packet formats, discuss ICMP source quench and Redirection messages. **3**

4C. How does DHCP operate when client and server are in two different networks? **2**

5A. Consider the network shown in Fig. Q5A with nodes A through F. Show the step-by-step execution of Dijkstra algorithm to calculate distance from node A to other nodes. **5**

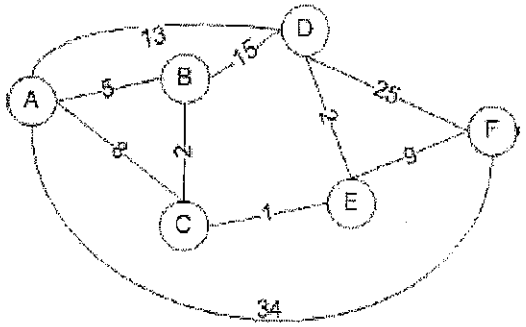

Fig. Q.5A

5B. What is resolution in DNS? Explain various resolution methods with suitable diagrams. **3**

5C. In a datagram, the M bit is zero, the value of HLEN is 5, the value of total length is 200, and the offset value is 200. What is the number of the first byte and number of the last byte in this datagram? Is this the last fragment, the first fragment, or a middle fragment? **2**