Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent institution of MAHE, Manipal)

II SEMESTER M.C.A

END SEMESTER EXAMINATIONS, APRIL/MAY 2019

SUBJECT: ADVANCED COMPUTER NETWORKS

[MCA 4202]

REVISED CREDIT SYSTEM

(26 /04/2019)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A Explain the functionalities of the different layers in the TCP/IP protocol suite with a neat diagram. **5**

1B Assume that four datagrams with same identification value are received by a host in the order given in the table. Following is the fragmentation offset and M bit value for each datagram as below- **3**

	Fragmentation offset	M bit
A	175	1
B	0	1
C	275	1
D	350	0

Arrange and explain these segments according IP reassembling strategy.

1C An address in a block is given as 200.11.8.45. Find the number of addresses in the block, the first address, and the last address. **2**

2A Describe the Protocol Structure of Internet Protocol IPv4 with a neat labelled diagram. **5**

2B 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. **3**

2C Write the steps needed to be followed to guarantee the proper operation of the classful subnetworks. **2**

3A Explain with a neat labelled diagram the components of an ARP package. **5**

3B A computer sends a timestamp request to another computer. It receives the corresponding timestamp reply at **3:46:07** A.M. The values of the original timestamp, receive timestamp, and transmit timestamp are **13,560,000**, **13,562,000**, and **13,564,300**, respectively. What is the sending trip time? What is the receiving trip time? What is the round-trip time? What is the difference between the sender clock and the receiver clock? **3**

3C Write about the following: **2**

(i) What is the minimum size of a UDP datagram?

(ii) What is the maximum size of a UDP datagram?

(iii) What is the minimum size of the process data that can be encapsulated in a UDP datagram?

(iv) What is the maximum size of the process data that can be encapsulated in a UDP datagram?

4A A host sends four packets and receives two acknowledgments in the order given below. The time is shown as **hour: minute: seconds**. Assume initial RTO=0:0:09 **5**

- Segment 1 was sent at 0:0:00.
- Segment 2 was sent at 0:0:05.
- ACK for segments 1 and 2 received at 0:0:07.
- Segment 3 was sent at 0:0:20.
- Segment 4 was sent at 0:0:22.
- ACK for segments 3 and 4 received at 0:0:40.

Calculate the values of RTT_M, RTT_S, RTT_D, and RTO. Draw the Time-line diagram for the data and acknowledgement exchange.

4B A router receives an IP packet with source IP address 130.45.3.3 and destination IP address 201.23.4.6. The router cannot find the destination IP address in its routing table. Fill in the fields (as much as you can) for the ICMP message sent. **3**

4C Suppose a TCP connection is transferring a file of 5500 bytes. The first byte is numbered 15021. What are the sequence numbers for each segment if data is sent in eight segments, each carrying 800 bytes? **2**

5A Consider the following IP datagram without options. Calculate 1's complement checksum for the datagram. Also explain, how receiver checks the correctness of the received datagram. **5**

4	5	1	4020
14567		1	175
14	6	0	
10.12.14.5			
12.6.7.9			
L	U	C	K

ASCII values are- L=76 U=85 C=67 K=75

5B Compare traditional network with wireless sensor networks. **3**

5C Write the pseudocode describing functionality of input module in ICMP package. **2**

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