Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

III SEMESTER M.C.A

END SEMESTER EXAMINATIONS, DECEMBER 2020

SUBJECT: Computer Networks

[MCA 5151]

REVISED CREDIT SYSTEM

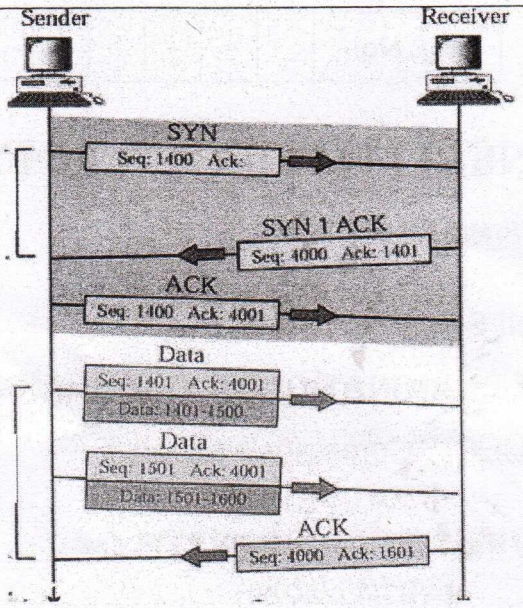
(31/12/2020)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A	Compare and Contrast ISO/OSI model with TCP/IP model with a neat labelled diagram.	**5**
1B	Describe the UDP-User Datagram Packet format with a neat labelled diagram.	**3**
1C	Briefly describe the Redirection (*Type-5*) ICMP error reporting message.	**2**
2A	The content of an IP packet is as follows in Hexadecimal. **47 00 00 60 30 39 50 00 05 06 00 00 7D 50 30 20 B4 0E 0F 02** **(i)** What is the size of the data? **(ii)** How many more routers can the packet travel to? **(iii)** What is the upper layer protocol number? **(iv)** Are there any options? If yes, what is the size of the option? **(v)** Is the packet fragment able?	**5**
2B	Consider the following packet flow-diagram given with RTT_M and calculate RTT_D, RTT_S, RTO (step-by-step) for each time RTT_M is measured.	**3**



2C	What is the use of URG flag in TCP segment?	**2**
3A	A large number of consecutive IP address are available starting at 198.16.0.0/16 Suppose that four departments W, X, Y and Z in an organization request 4000,2000,4000 and 8000 addresses, respectively, and in that order. For each of these, give the first IP address assigned, the last IP address assigned and the mask in the w.x.y.z/s notations.	**5**
3B	Consider the following scenario of sliding window in which host *A* has sent bytes number 499,500,501,502,503 to host *B* and received an *ACK* packet with acknowledgement number 501 and *rwnd* 5 from host *B*.	**3**

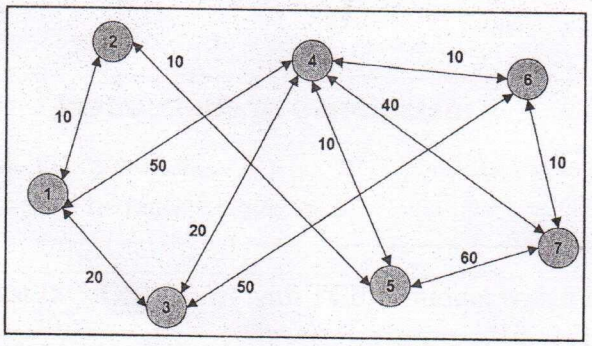
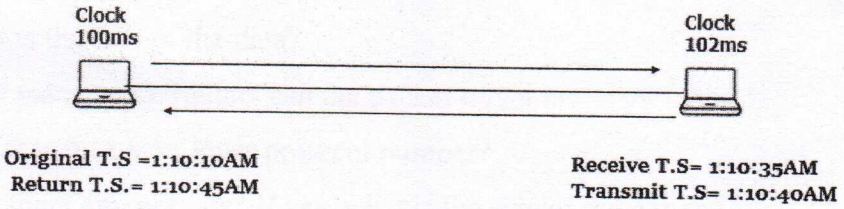
			<------ rwnd=5 ------>									
.....	499	500	501	502	503	504	505	506	507	508	509	....
			not acknowledged									

(i) Now, how many bytes (say **X** bytes) and range of bytes host *A* can send to *B* without worrying about buffer space available at host *B*?

After sending **X** number of bytes to host *B*, assume that host *A* receives an *ACK* with acknowledgement number 505 and *rwnd* 7.

(ii) Draw the new sliding window after receiving *ACK* 505 and *rwnd* 7.

3C	Mention the two solutions to resolve the silly window syndrome created by receiver in TCP protocol.	**2**

4A	Explain the following used in IP Packet forwarding in the context of forwarding based on destination address with neat labelled diagrams: **(i)** Next-hop Method **(ii)** Network-Specific Method **(iii)** Host-Specific Method **(iv)** Default Method.	**5**
4B	What is netid and hostid of a network? Find the netid and the hostid of the following IP addresses: **(i)** 114.34.2.8 **(ii)** 132.56.8.6 **(iii)** 208.34.54.12 **(iv)** 251.34.98.5	**3**
4C	Draw a neat TCP congestion policy summary diagram with proper labels.	**2**
5A	Write the algorithm depicting the working of input and output module of ARP Package.	**5**
5B	Consider the following segment of Internet that consists of 7 nodes and 11 links:  Determine the shortest route tree based on the home node "1" and connecting to all other nodes, using Dijkstra's algorithm.	**3**
5C	Consider the following time stamps (use universal timestamp) recorded at two systems when ICMP Timestamp messages are exchanged.  Find the clock difference between the two systems.	**2**

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