Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VI SEMESTER B.TECH.

END SEMESTER EXAMINATIONS, APR/MAY 2017

SUBJECT: OPEN ELECTIVE II - NETWORKING WITH TCP/IP [ICT 3284]

REVISED CREDIT SYSTEM
(03/05/2017)

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 address starting with 120.60.192.0/20. The ISP wants to distribute these blocks to 100 organizations with each organization receiving 8 addresses only. Design the sub-blocks and give the slash notation for each sub-block. Find out how many addresses are still available after these allocations. 5

1B. Explain three-way handshaking used by the TCP to establish a connection. 3

1C. List and explain IGMP message types in detail. 2

2A. Explain the functionalities of Internet layer of TCP/IP architecture with neat diagram. 5

2B. A host IP address is 128.2.3.2. Identify the following from given host IP address.

i. Network Address
ii. Direct Broadcast address
iii. Limited Broadcast address
iv. This host on this network address
v. Specific host on this network
vi. Loopback address

3

2C. Show the sub-option negotiation between TELNET client and server for enabling terminal type as "VT". 2

3A. A DNS client is looking for the names of the computer with IP address 132.1.17.8 and 128.3.5.17.5. Show both the query and response messages assuming that the names are **mail.google.com** and **ict.mit.manipal.edu**. Also, with response message include extra 1,536 bytes of authoritative data and send to the DNS client. Assume that DNS uses UDP service for communication. 5

3B. Consider Host Z is constructing spanning tree. Use Dijkstra's algorithm to compute the shortest path for the network shown in **Fig. Q.3B.**

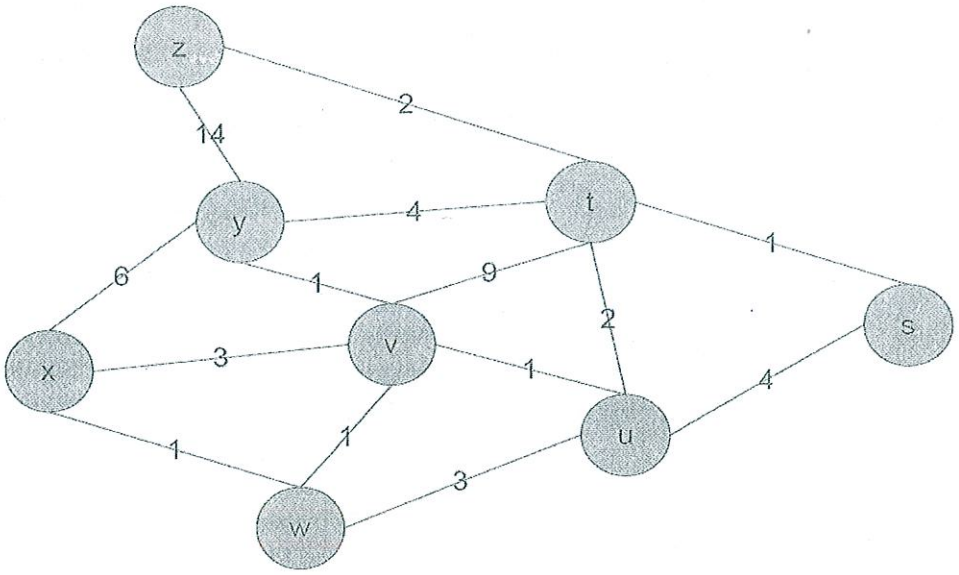

Fig. Q.3B.

3C. What is the use of URG, ACK, PSH, RST, SYN and FIN flag in TCP segment? 3 2

4A. Explain how UDP is different from TCP. With neat diagram explain how port numbers are used in Daytime client-server communication. Also, show message exchanged between client and server clearly. 5

4B. A computer sends a timestamp request to another computer. It receives corresponding timestamp reply at 3:46:07 AM. The values of original timestamp, received timestamp and transmit timestamp are 13,560,000, 13,562,000, and 13,564,300 respectively. What is the sending trip time? What is receiving trip time? What is round trip time? What is the difference between the sender clock and receiver clock? 3

4C. List all network topology with neat diagram. 2

5A. Suppose a data of size 5022 bytes is passed to IP for delivery across two networks of the internet (i.e. from the source host to a router then to the destination host). The first network uses 14 byte header and has an MTU of 1024 bytes, the second network uses 8 byte header with an MTU of 512bytes. MTU gives the size of the largest IP datagram that can be carried in a link layer frame. Give the details of every fragment delivered to the network layer at the destination host with size, flags, identification number and offset. Assume all IP headers are 20 bytes. 5

5B. List all the services offered by the stream control transmission protocol (SCTP) to application layer process. 3

5C. A node with network address A and physical address 20 wants to send data to a node with network address P and physical address 95 which located on another LAN network. Represent the addresses (MAC & IP) for the flow of the datagram from the source to the destination. 2