Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104
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FIFTH SEMESTER B.E. (IT) DEGREE MAKEUP EXAMINATION, DECEMBER – 2012
SUBJECT: COMPUTER NETWORKS (ICT305)
(REVISED CREDIT SYSTEM)

TIME: 3 HOURS **31/12/2012** **MAX. MARKS: 50**

Instructions to candidates
Answer any **FIVE FULL** questions.
Missing data, if any, may be suitably assumed.

1A. List and explain all Ethernet network topologies.

1B. A multicast router contains 4 groups (W, X, Y and Z). There are three hosts on the LAN. Host A has three loyal members belonging to group W and loyal member belonging to X. Host B has 2 loyal members belonging to group W and one loyal member belonging to group Y. Host C has no processes belonging to any group. Show the IGMP involved in monitoring.

1C. The following is the dump of a UDP header in hexadecimal format-

06 32 00 0D 00 1C E2 17

a. What is the length of the user datagram?
b. What is the length of the data?
c. Is the packet directed from a client to server or vice-versa?
d. What is the client process??

[5+3+2]

2A. Suppose that host A is connected to router R1, R1 is connected to another router R2 and R2 is connected to host B. Suppose that a TCP message that contains 900 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 fragmentation offsets of IP header in each packet transmitted over the three links. Assume that link A to R1 can support a maximum frame size of 1024 bytes including a 14 byte frame header, link R1 to R2 can support a maximum frame size of 512 bytes, including an 8 byte frame header, and link R2 to B can support a maximum frame size of 512 bytes including a 12 byte frame header.

2B. List Congestion control algorithms of VC subnet and Datagram subnet.

2C. Give frame format of source routing bridge. [5+3+2]

3A. What are the situations where there will not be any ICMP error messages? And also explain redirection concept.

3B. Consider a building CSMA/CD network running at 1Gbps over a 1km cable with no repeater. The signal speed in the cable is $20x10^7$m/sec. What is the minimum frame size? What is the frame transmission time to $2x10^5$ bits?

3C. Explain the necessity of flag in timestamp option of IP Header. [5+3+2]

4A. A router has following entries in its routing table R1. Draw the network topology.

Mask	Network Address	Next-hop Address	Interface
/26	140.24.7.192	240.100.1.2	m1
/24	140.24.7.0	200.1.1.1	m0
/16	240.100.0.0	----	m1
/16	100.100.0.0	200.1.1.1	m0
/8	200.0.0.0	----	m1
/0	Default router	200.1.1.2	m1

4B. A pure ALOHA network transmits 200 bit frames on a shared channel of 200 kbps. What is the throughput if the system (all station together) produces?

a. 1000 Frames per second
b. 500 Frames per second
c. 250 Frames per second

4C. What are Differences between Leaky bucket and Token Bucket flow control algorithms? [5+3+2]

5A. Prove that hierarchical routing technique reduces path length and saves space in routing table with an appropriate example.

5B. An organization granted the block 16.0.0.0/8. The administrator wants to create 500 fixed length subnets.

a. Find the subnet mask.
b. Find the number of addresses in each subnet
c. Find the first and last address in the 3^{rd} subnet.

5C. What is the significance of sending and receiving buffer in TCP stream delivery service? [5+3+2]

6A. Explain proxy ARP with an example. Give frame format of ARP.

6B. Explain the half close operation of TCP with neat diagram.

6C. A, B and C terminals are attached by a dedicated pair of lines to a hub in a star topology. The distance from each terminal to the hub is 2.5 km, the speed of the transmission lines is 1Gbps, all frames are of length 2500 bytes and the signal propagates on line at a speed on $2*10^8$ m/s. Compare total time required to transmit 2 frames from A to C when the hub is implementing collision free slotted ALOHA and CSMA. [5+3+2]

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