EASTERN UNIVERSITY, SRILANKA
Department of Mathematics
Third year Second Semester Examination in Science – 2008/2009

CS 302 – COMPUTER NETWORK
(Special Repeat)

Answer all questions   Time allowed: 2 Hours

Q1)

a. What do you mean by a 'Computer Network' and explain their usage?

b. Discuss the necessity for connecting the schools and the government institutes via network.

c. Write the short notes on the following network types:

   i.   Local Area Network (LAN);

   ii.   Wide Area Network (WAN);

   iii. Metropolitan Area Network (MAN).

d. Write the short notes on the following network topologies:

   i.   Bus topology;

   ii.   Ring topology;

   iii. Star topology.

Q2)

a. Describe each of the following switching techniques:

   i).   Circuit switching;

   ii). Packet switching.

b. Describe the following modulation techniques:

   i).   Amplitude Modulation (AM);

   ii). Frequency Modulation (FM).

c. Suppose a message block (frame) is to be transmitted across a data link using a CRC for error detection. If the generator polynomial is $G(x) = x^4 + x^3 + 1$, generate the CRC code for the message bit **11110110**.

Q3)

a. Briefly describe the 'ISO-OSI' reference model, stating the major responsit each layer.

b. Describe the process of information exchange between the layers of 'I reference model.

c. Describe the principal difference between connectionless communicat connection-oriented communication.

Q4)

a) The data link layer is responsible for the final encapsulation of high messages into frames that are sent over the network at the physical layer several methods to handle the framing such as Character Count, Byte Stuf Bit Stuffing.

Consider a data link layer that uses the following character encoding:

A: 01000111; B: 11100011; FLAG: 01111110; ESC: 11100000

Write how the bit sequence (in binary) transmits for the following frames wh Stuffing and Bit Stuffing framing methods are used:

i). A B ESC FLAG B

ii). FLAG ESC B ESC ESC FLAG

b) Describe how CSMA and CSMA/CD handles the data collision in a network