



EASTERN UNIVERSITY, SRILANKA
THIRD EXAMINATION IN SCIENCE – 2005/2006
SECOND SEMESTER (March/ April, 2008)

CS 302 – COMPUTER NETWORKS
(Special Repeat)

Answer all questions

Time allowed: 2 Hours

Q1)

- a. What do you mean by a 'Computer Network' and explain their usage?
- b. Write the short notes on the following topologies with the aid of diagrams:
 - i. Bus topology;
 - ii. Ring topology;
 - iii. Star topology.
- c. Describe each of the following switching techniques:
 - i. Circuit switching;
 - ii. Packet switching.

Q2)

- a. Describe the following modulation techniques:
 - i). Amplitude Modulation (AM);
 - ii). Frequency Modulation (FM).
- b. Suppose a series of 8 bit 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**.
- c. If the received bit pattern is **111100101000**, use the CRC error detection technique to verify whether it is erroneous or not. Justify your answer.

Q3)

- a. Briefly describe the 'ISO-OSI' reference model, stating the major responsibilities of each layer.
- b. Describe the process of information exchange between the layers of 'ISO-OSI' reference model.
- c. Describe the principal difference between connectionless communication and connection-oriented communication.

Q4)

- a) Compare and contrast 'Go-back-N' and 'Selective Repeat' protocols.
- b) Two neighboring nodes (**A** and **B**) use a sliding-window protocol with a 3-bit sequence number. As the ARQ (Automatic Repeat Request) mechanism, **Go-back-N** is used with a window size of 4. Assuming **A** is transmitting and **B** is receiving, show the window positions for the following succession of events:
 - i). Before **A** sends any frames.
 - ii). After **A** sends frames 0, 1, 2 and **B** acknowledges 0, 1 and the ACKs (acknowledgements) are received by **A**.
 - iii). After **A** sends frames 3, 4 and 5 and **B** acknowledges 4 and the ACK is received by **A**.