

EASTERN UNIVERSITY, SRI LANKA
RD EXAMINATION IN SCIENCE 2003/2004 (Repeat)
SECOND SEMESTER (June/July, 2005)

CS302.- Computer Network

Answer All Questions

Time Allowed: Two hours

- (a) List the seven layers of the OSI reference model and briefly describe the function of each layer. {40}
- (b) Describe the principal difference between connectionless communication and connection-oriented communication {15}
- (c) Give a description of the application and limitation of each of the following types of transmission media:
- i. Coaxial cable
 - ii. Optical fiber cable
 - iii. Satellite microwave {3 × 15 = 45}
2. (a) Briefly describe the characteristics of the following multiplexing:
- i. Frequency-Division Multiplexing
 - ii. Synchronous Time-Division Multiplexing {2 × 15 = 30}
- (b) Describe each of the following switching techniques:
- i. Circuit switching
 - ii. Packet switching {2 × 15 = 30}
- (c) List the main types of network topology currently in widespread use for LAN's and, with the aid of sketches, explain their operation. {40}

3. (a) Briefly describe the services provided by the data link layer to the network layer. {20}

(b) Describe:

i. Character oriented transmission with character stuffing

ii. Bit oriented transmission with bit stuffing {2 × 20 = 40}

(c) Describe the principle of operation of a CRC error detection method {15}

Suppose a series of 8-bit message blocks (frames) is to be transmitted across a data link using a CRC for error detection and a generator polynomial, $G(x) = x^4 + x + 1$. Generate the CRC code for the message 1101011011. {25}

4. (a) Briefly describe the data link protocol '**Simplex Protocol for a Noisy Channel**'. {15}

(b) With the aid of suitable examples, discuss the sliding window protocol

i. using Go-Back-N

ii. using Selective repeat. {2 × 25 = 50}

Suppose, a sliding window protocol is used in a Computer Network with three bits for the packet sequence number.

Find out the maximum window size in each of the above cases. Explain your answer. {20}

(c) Briefly describe the Eastern University Campus Wide Area Network setup. {15}