

1. Define the following terms:

- a. Domain name
- b. host name
- c. IP address
- d. Physical address
- e. Domain Name System
- f. Well-known port number
- g. Ephemeral port number
- h. Network id
- i. Host id
- j. URL

2. Stations A and B communicate as follows. Station A waits until it receives a poll message from station B. The poll message authorizes station A to send one frame of information to station B. Station A returns to the wait state after it complete transmission of a frame. Errors can occur and frames can be lost in both directions. Develop a *detailed* method that uses error detection and retransmission so that this polling method can be used to reliably transfer information from station A to station B. Explain how sequence numbers are used and show a state transition diagram that demonstrates that the method works correctly. You may assume that propagation delay is very small.

3.

i) A speech signal is transmitted digitally over a communication network.

The bandwidth of the signal is 8 KHz and we would like to encode the signal so that the quantization error is always less than 1% of the peak value of the signal. Determine the bit rate of the signal.

ii)

If the resulting signal is transmitted using a signalling constellation size of 16 points. Determine the bandwidth of the channel required.

iii)

An error control scheme uses a CRC code based on the polynomial $x^4 + x + 1$. If the information bit sequence is 10010100100001001110, determine the transmitted bit sequence.

iv)

The above CRC scheme is used in a TDMA system where 6 users share a common communication channel. The average information bit rate for each user is equal to 10 Kbps. Determine the overall bit rate in the channel.