Mahindra University

Mahindra University, Hyderabad
Ecole Centrale School of Engineering
Minor-I

Program: B. Tech. **Branch: CSE,ECE and CM** **Semester: VI**
Subject: Computer Networks(CS 3203)

Date: 29.02.2024 **Time: 10.00-11.30AM**
Time Duration: 1.5 Hours **Max. Marks: 40**

Note: All questions are compulsory.
All sub-questions of a question must be written at one contiguous place.

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(1) (a) In asynchronous transmission, explain framing error with an example. [2]
(b) Describe at least 3 unguided transmission media with examples. [3]
(c) A typical telephone subscriber loop has a usable audio bandwidth of 0-8000 Hz. Voice samples for digital transmission using a modem are represented in 4 bits. What is the bit rate required for the digital transport of voice? What is the permissible S/N ratio to support this bit-rate? [1.5+1.5]
(d) Describe various transmission modes with examples. [2]

(2) Suppose we want to transmit the message 1011 0010 0100 1011 and protect it from errors using the CRC-8 polynomial x^8+x^2+x+1.
(a) Use polynomial long division to determine the message that should be transmitted. [2]
(b) Suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of the receiver's CRC calculation? How does the receiver know that an error has occurred? [2+1]
(c) Suppose you are designing a sliding window protocol for a 1-Mbps point-to-point link to the stationary satellite revolving around the Earth at an altitude of 3×10^4 km. Assuming that each frame carries 1 KB of data, what is the minimum number of bits you need for the sequence number in the following cases? (Assume the speed of light is 3×10^8 m/s.) [1.5+1.5]
(i) Receiver's Window Size = 1.
(ii) Receiver's Window Size = Sender's Window Size.
(d) Write the functionality of PCM with help of an example. [2]

(3) (a) Explain with a diagram, the setup and working of an ADSL. [3]
(b) Represent the signal 00110100010 using ASK, FSK, and PSK. [3]
(c) State the differences between the working of a bridge, a router and a gateway. [3]
(d) How can data rate be increased while using the same bandwidth? [1]

(4) (a) List and explain the protocols used in each layer of TCP/IP protocol stack. [3]
(b) What is end-to-end communication? What advantage does a circuit-switched network have over a packet-switched network? [4]
(c) Write a short note on Error Control mechanisms. [3]