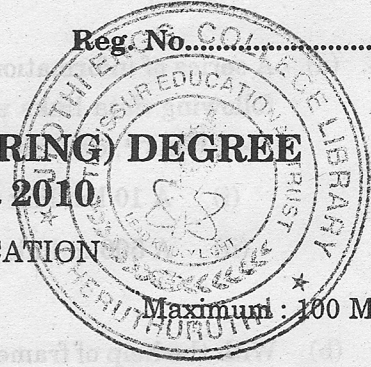


**FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE  
EXAMINATION, DECEMBER 2010**

IT 04 502 – DIGITAL DATA COMMUNICATION



Time : Three Hours

Maximum : 100 Marks

*Answer all questions in Part A.**Answer (a) or (b) in the questions numbered 2,3,4 and 5 in Part B.***Part A**

1. (a) What are the various attenuation and distortion effects that can degrade a signal during transmission.
- (b) Briefly explain about the standards associated with the TCP/IP suite.
- (c) Explain the circumstances under which a DPLL circuit is used to achieve clock synchronization?
- (d) What is scrambler? Explain about NRZ and NRZI signal encoding.
- (e) Differentiate between connection-less mode transmission and connected-oriented transmission.
- (f) Differentiate between Selective repeat and Go-back-N schemes.
- (g) Differentiate between the terms 'poll', and 'select' in relation to the BSC protocol.
- (h) Briefly explain about HDLC protocol.

(8 × 5 = 40 marks)

**Part B**

2. (a) With the aid of sketches, explain the effect on a transmitted binary signal of the following.  
(i) Attenuation (ii) Limited Bandwidth (iii) Line and system noise.  
*Or*  
(b) Explain the terms 'signal propagation delay' and 'transmission delay'. Assuming the velocity of propagation of an electrical signal is equal to the speed of light, determine the ratio of the signal propagation delay to the transmission delay, for the following types of data link and 1000 bits of data. (i) 2.5km of coaxial cable and a transmission rate of 10Mbps (ii) A satellite link and a transmission rate of 512 kbps.
3. (a) Explain with the help of an example the principle of operation of CRC error detection method.  
*Or*  
(b) With the aid of an example, illustrate the rules that are used to construct the Huffman code tree for a transmitted character set.

**Turn over**

4. (a) A series of information frames with a mean length of 100 bits is to be transmitted across the following data links using an idle RQ protocol. If the velocity of propagation of the link is  $2 \times 10^8 \text{ ms}^{-1}$ , determine the link efficiency (utilization) for each type of link
- A 10 km link with a BER of  $10^{-4}$  and a data transmission rate of 9600 bps.
  - A 500 m link with a BER of  $10^{-6}$  and a data transmission rate of 10 Mbps.

Or

- (b) With the help of frame sequence diagrams illustrate the essential features of the operation of the idle RQ protocol.
5. (a) Explain the operation of the Kermit protocol used for the transfer of files of data from one computer to another.

Or

- (b) Produce a sketch of a time sequence diagram showing the user service primitives associated with the data link control layer assuming the following operational modes.
- Connection less (best-try)
  - Connection-oriented (reliable)

(4 × 15 = 60 marks)