Unit - V

5. a) Explain interleaved code and block codes.

   b) Represents the message "3p.bat" in ASCII code. The parity bit position may be kept as 0.

   c) Explain the two approaches to correction of errors -

      i) Reverse Error Correction (REC)

      ii) Forward Error Correction (FEC)

   d) Detect and correct the single error in the received hamming code word 10110010111 (Assume ever parity).

OR

Given the data word 1010011010 and the divisor 10111.

i) Show the generation of the code word at the sender site. (Using binary division)

ii) Show the checking of the codeword at the receiver site. (Assume no error)

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Roll No .....

CS/IT - 501

B.E. V Semester

Examination, December 2015

Data Communication

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) Define the basic model of data communication.

   b) Draw the signal wavelength when D0110101 is transmitted using following codes -

      i) NRZ-L ii) NRZ-M

   c) We want to transmit 500 characters with each character encoded as 8 bits -

      i) Find the number of transmitted bits for synchronous transmission

      ii) Find the number of transmitted bits for Asynchronous transmission

d) What is data compression? Explain lossy and lossless techniques for data compression with suitable examples.

OR

Find the bandwidth for a signal transmitting at 12 Mbps for QPSK. The value of d=0. Also draw the constellation diagram for it.

Unit - II

2. a) Distinguish with three points between multilevel TDM, multi slot TDM and pulse-stuffed TDM.

b) Define Spread Spectrum and its goal. List the two spread spectrum techniques.

c) Compare circuit, message and packet switching techniques.

d) An FHSS system uses a 5-bit PN sequences. If the bit rate of the PN is 64 bits per second, answer the following questions -

i) What is the total number of possible hops?

ii) What is the time need to finish a complete cycle of PN?

OR

Two channels, one with bit rate of 150 kbps and another with a bit rate of 400kbps, are to be multiplexed using pulse stuffing TDM with no synchronization bits. Answer the following questions -

i) What is the size of the frame in bits?

ii) What is frame rate?

iii) What is data rate?

Unit - III

3. a) How do guided media differ from unguided media?

b) Write the specification of RJ-45 and RJ-11.

c) Explain the ADSL technology in details.

d) Explain four basic network topologies and cite an advantage of each type. Also calculate How many cables and ports are needed for each device when five devices are arranged in a mesh topology?

OR

Explain the following :

i) Active Hubs

ii) Passive Hubs

iii) Repeater

iv) BNC connector

Unit - IV

4. a) What are three major classes of guided media?

b) What is the purpose of cladding is an optical fiber?

c) A light signal is travelling through a fiber. What is the delay in the signal if the length of the fiber cable is 50, 100 m. (Assume a propagation speed of 2×10^8 m) ?

d) Explain the following :

i) Radio wave

ii) Microwave

iii) Infrared and satellite communication

OR

What is DSL Technology? What are the services provided by the telephone companies using DSL? Distinguish between a DSL Modem and DSLAM.