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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech.(ECE)/(ETE) (2011 Onwards)**  
**B.Tech.(Electronics Engg.) (2012 Onwards) (Sem.-5)**

**DIGITAL COMMUNICATION SYSTEM**

**Subject Code : BTEC-501**

**Paper ID : [A2103]**

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt ANY FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt ANY TWO questions.

**SECTION-A**

**1. Write briefly :**

- a) What is the function of low pass filter in sampling?
- b) Justify the term Companding.
- c) What is slope over load distortion in Delta modulation?
- d) Draw the wave forms for a binary sequence 1011010 for Bipolar RZ and Manchester NRZ format.
- e) Define HDB coding and write its advantages.
- f) Write advantages and disadvantages of DPSK system.
- g) Write advantages of MSK over QPSK.
- h) What do you mean by imperfect bit synchronization?
- i) What do you mean by Non-linear quantization?
- j) Justify the term Bit versus Word interleaving.

**SECTION-B**

2. Explain the term Quantization error and derive an expression for maximum signal to noise ratio in PCM system, that uses Linear quantization. (5)
3. Why MSK is called shaped QPSK? For MSK explain expression and wave forms for the signal 11000111. (5)
4. a) What is pulse shaping? Define equalizer. (2)  
b) Write a note on eye diagram. (3)
5. A TV signal having bandwidth of 4.2 MHz is transmitted using binary PCM system. Number of quantization levels are 512. Determine a) Code word length b) transmission band width c) Final bit rate. (5)
6. Show that Error probability of ASK system is  $p_e = \frac{1}{2} \operatorname{erfc} \sqrt{\frac{E}{4N_0}}$ . (5)

**SECTION-C**

7. Explain various Digital data formats and compare them.
8. Explain BPSK system with its transmitter, receiver, Geometrical and band width representation.
9. A DMS X has five symbols  $x_1, x_2, x_3, x_4, x_5$  with probability  $p(x_1) = 0.4, p(x_2) = 0.19, p(x_3) = 0.16, p(x_4) = 0.15, p(x_5) = 0.1$ .  
a) Construct a Shannon-Fano code for X, Calculate the efficiency of the code.  
b) Repeat for the Huffman code and compare the results.