D17002012

Registration No: | | | | | | | | | | |

Total Number of Pages : 02 **M.TECH**

M.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2017
ADVANCED DIGITAL COMMUNICATION TECHNIQUES
Branch: EC, Subject Code:MECPC1010
Time: 3 Hours
Max Marks : 70
The figures in the right hand margin indicate marks.

PART-A

(10 X 2=20 MARKS)

1. Answer the following questions.

a. What is minimum in MSK?

b. Give the spectrum of AWGN.

c. Why QPSK is better than BPSK? Justify your answer.

d. What is ISI and why it occurs?

e. Give example of multi carrier communication scheme and mention its signal dimension. What is the specific advantage of using multi carriers?

f. Write the need for symbol synchronization in digital communication.

g. Draw the signal space diagram for BPSK and BFSK and also calculate the BW.

h. What is bit rate?

i. What do you mean by a spread spectrum signal?

j. What are the properties of matched filter

PART-B

(5 X 10=50 MARKS)

Answer any five questions from the following.

2. a. Calculate the error probability for PSK signalling.

b.Write the expression for a QAM signal. Show the constellation diagram of an 8-ary QAM scheme with binary ASK and 4-ary PSK combination. Also derive the expression for the Euclidian distance between signal points in a M-ary QAM scheme.

3.a. What are the parameters to be estimated in a digitally modulated signal? What are the different basic approaches for estimation?

b. Explain the working principle of PLL and state about its utility.

4. a. Write the characteristics of band limited channels?

b. State & prove Nyquist pulse shape criterion for zero ISI.

5. a. How do you mathematically represent M-ary FSK signals? What should be the frequency separation between adjacent signals to call it a MSK signal? Establish analytically. Draw the approximate PSD spectrum of a MSK signal and find its bandwidth. Why is it viewed as a modulation with memory?

   b. Explain the power spectral density for linearly modulated signals.

6. a. What for carrier parameter estimation at the receiver is a necessity in digital communication systems? Derive the ML function in the phase estimation of an unmodulated carrier Acos ω_0t and hence show that a PLL can track the phase of the incoming signal.

   b. How ML estimation of a decision directed symbol timing is implemented using a tracking loop? Draw the block schematic of the loop and explain its functioning. What is an Early-Late Gate synchronizer?

7. a. What is processing gain and jamming margin in DS-SS system? What is the role of PN-sequence generator in the SS-Communication system?

   b.What are the properties of PN sequences? How synchronization is achieved in a SS- system?

8. a. Write the difference between DPCM and DM.

   b.What is a channel equalizer? Discuss about the different equalizer structures.

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