

End Semester Examinations - 2015-16 Even Semester - May 2016

14EC3035 Digital Communication Receiver

Set A

Time : 3 hrs
Total Marks: 100

1. 1)a) How will you judge the performance of any digital communication receiver? (5)
b) With neat block diagram, illustrate the process of error detection in coherent binary PSK system. (15)
OR
2. 2)a) Draw the block diagrams of MSK transmitter and MSK receiver. Using the quadrature and in-phase components, estimate the probability of error of MSK systems. (15)
b) Draw the generalized binary receiver for non coherent orthogonal modulation techniques. (5)
3. 3) a) How will you use LMS algorithm for recursive estimation in linear MMSE detector? (10)
b) With mathematical equations, explain the application of subspace based linear de-correlating detector for estimating the bit streams in the received signal. (10)
OR
4. 4) a) Formulate the mathematical model of received signal in multipath systems. (10)
b) Explain the algorithm of linear MMSE detector for estimating the bit streams under multiuser conditions. (10)
5. 5) a) Comment briefly on the various types of NBI suppression methodologies. Include diagrams wherever necessary. (10)
b) How will you model the received signal for bit stream estimation with the presence of Narrow Band Interference? (10)
OR
6. 6) a) How will you use ACM filter for estimating the state of any linear system? (15)
b) Comment briefly on HMM based methods for NBI suppression. (5)
7. 7) Explain the carrier recovery and symbol synchronization techniques in M-ary PSK receiver and M-ary PAM receiver with neat diagrams. (20)
OR
8. 8) With neat diagrams, formulate the mathematical equations for estimating the linear equalizer coefficients using:
(a) Zero - forcing algorithm (10)
(b) LMS algorithm (10)
9. 9) Encode the alphabets {a1, a2, a3, a4, a5, a6} with corresponding probabilities {0.3, 0.05, 0.2, 0.05, 0.25, 0.15} using the Huffman coding methodology. Repeat the same problem using the minimum variance Huffman coding technique also. Compare both the techniques in terms of entropy and efficiency. (20)

Wishing you All the Best