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Reg. No. : .....

Name : .....

Seventh Semester B.Tech. Degree Examination, June 2016
(2008 Scheme)
08.755 (Elective – III)
CDMA SYSTEMS (T)

Time : 3 Hours Max. Marks : 100

***Instruction** : Answer **all** questions from Part **A** and **two** questions from **each** Module of Part **B**.*

PART – A **(4×10=40 Marks)**

1. Explain processing gain for DS-CDMA system.
2. Find the processing gain W/R if the radio channel capacity is $K_0 = 100$ and the required signal to noice ratio at the demodulator output is equal
   a) 3 dB b) 5 dB
   c) 10 dB d) 20 dB.
   Neglect the influence of back ground noice.
3. Explain the coherent reception of DS-CDMA signals for uplink transmission.
4. What is called frequency hopping SS ? Explain slow and fast FHSS.
5. Explain the need for power control in CDMA systems.
6. What do you mean by PN sequence ? Explain how a PN sequence is generated using ML linear shift register.
7. Explain the properties of orthogonal codes.
8. What is interference cancellation in CDMA networks ?
9. Write short notes on MMSE linear multiuser detection.
10. Explain the working of Decorrelation Receiver.

P.T.O.

PART – B (6×10=60 Marks)

Module – I

11. Discuss the radio channel capacity for a DS-CDMA system.

12. Explain the various modulation schemes used in spread spectrum systems.

13. A total of 30 equal power users are to share a common communication channel by DS-CDMA. Each user transmits information at a rate of 10 K bits/Sec. Determine the minimum chip rate to obtain a bit error probability of 10^{-5} if
    a) Additive noice in the receiver can be ignored.
    b) Eb/No = 12 dB.

Module – II

14. Explain the tracking of direct sequence spread spectrum signal in detail.

15. Explain the randomness properties of maximal length sequences with necessary equations.

16. Find the Fourier transform of the pulses hTp(t) if
    a) $hTp(t) = \delta(t)$
    b) $hTp(t) = \begin{cases} \cos 2\pi fct & 0 < t \leq T \\ 0 & \text{otherwise} \end{cases}$

Module – III

17. With the help of neat diagrams explain the working of SIC and PIC receivers.

18. Briefly explain multicarrier CDMA system.

19. Explain the working of Decorrelation receiver.