



Reg. No. :

Name :

Seventh Semester B.Tech. Degree Examination, April 2015
(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



1. Explain Pulse Position Hopped Spread Spectrum System.
2. Find the radio channel capacity of a PPH CDMA system if the system uses impulse radio with pulses of duration $T_c = 10^{-8}$ s. The user transmission rate is $R = 10$ kb/s and the required bit error probability is $P_b = 10^{-5}$. The repetition code is used. Neglect the other cell interference and background noise.
3. Write a brief note on Quasi-orthogonal expansion of spread spectrum signals.
4. Explain about serial search Acquisition Scheme.
5. Explain the concept of hand off strategy in CDMA system.
6. Explain how a PN sequence is generated using ML linear shift register.
7. What do you mean by the Run length property of PN sequence ? Explain with an example.
8. Write short notes on the Power Control and its need in CDMA.
9. What is near far problem ? Explain the methods to solve this problem.
10. Explain the working of SIC receivers. (10×4=40 Marks)



PART – B
Module – I

11. With the help of relevant diagrams explain the working of FHSS systems.
12. Explain the modulation schemes used in DS-SS systems.
13. Find radio channel capacity of single cell DS-CDMA system if the total bandwidth of the duplex channel is 25 MHz, the individual transmission rate of the user is $R = 10^4$ bits/s and the required bit error probability is $P_b = 10^{-5}$. The repetition code is used. Neglect the influence of background noise. Consider the cases :
 - a) No voice activity detection, omni directional antennas.
 - b) Voice activity detection with $r_v = 8/3$ 3 sector antennas.

Module – II

14. Explain in detail the term Erlang capacity of CDMA system.
15. Explain the coherent reception of FHSS signals for up link transmission.
16. Consider a DS – CDMA system with BPSK where the spreading sequence is generated by MLSR of length 7. The channel is undergoing Rayleigh Feding. Determine the minimum time to acquisition if $K = 100$, $N = N_p$, $T_c = 0.5 \mu s$, $r = 1.2$, $P_B = 8$ dB.

Module – III

17. Explain the working of decorrelation receiver in synchronous channels.
 18. Explain with neat diagram the different power control techniques implemented in CDMA systems.
 19. Explain in detail :
 - a) Interference cancellation
 - b) Hand off strategy.
 - c) SIC and PIC.
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