

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION

(2013 Scheme)

**13.705.6 CDMA SYSTEMS (T) (ELECTIVE III)**

Time: 3 Hours

Max. Marks: 100

.....  
**Instruction:** Answer all questions from Part A

**PART - A**

1. Give orthogonal expansion of SS signals.
2. What do you mean by PPH Spread spectrum systems?
3. What are the Modulation schemes of spread spectrum systems?
4. Explain processing gain of DS-CDMA system.
5. Explain run property of PN sequence.
6. Explain handoff strategies in CDMA Systems.
7. Explain the need for power control in CDMA systems.
8. Give the Shannon capacity of DS-CDMA.
9. What is MUD?
10. Give optimum detector for synchronous channel. **(10x2=20 Marks)**

**PART - B**

**(Answer any one full question from each module)**

**Module - I**

- 11 (a). Describe the working of direct sequence spread spectrum systems.
- (b). Describe coherent reception of FH-SS signals. **20 marks**

OR

- 12 (a). Explain the generation of frequency hopped spread spectrum signals.
- (b). Explain orthogonal and Quasi-orthogonal expansion of spread spectrum signals. **20 marks**

## Module - II

- 13 (a). Describe forward error control coding in spread spectrum systems.  
(b). Explain orthogonal convolution coding in DS-CDMA systems. **20 marks**

OR

- 14 (a). Describe acquisition process of FH-CDMA systems.  
(b). Explain how a PN sequence is generated using ML linear shift register. **20 marks**

## Module - III

- 15 (a). Derive Erlang capacity of CDMA system.  
(b). Describe acquisition process of synchronisation in pseudo random signals. **20 marks**

OR

- 16 (a). With the help of block diagram explain the working of PIC receiver.  
(b). What is Erlang capacity of a system? Explain the models to determine occupancy. **20 marks**

## Module - IV

- 17 (a). Explain optimum detector for asynchronous channels – 2 user.  
(b). Describe non-decorrelating linear multi user detector. **20 marks**

OR

- 18 (a). Explain matched filter in the CDMA channel and calculate the probability of error for synchronous users.  
(b). Explain the working of MMSE receiver and state its merits. **20 marks**

**(20X4=80 Marks)**