

Code: 9A04804

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B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**SPREAD SPECTRUM COMMUNICATIONS**

(Electronics &amp; Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Discuss about baseband modulation techniques.  
(b) Write short notes on hybrid spread spectrum systems.
- 2 (a) List out the properties of PN (Pseudo Noise) sequences.  
(b) Give the classification of periodic sequences.
- 3 (a) Describe the characteristics of a frequency hopped signal with neat sketches.  
(b) Discuss about interference rejection in a frequency hopping receiver.
- 4 (a) Discuss about digital tapped delay lines.  
(b) Discuss about charge coupled devices.
- 5 (a) With a neat block diagram, explain about coherent direct sequence receiver.  
(b) Discuss about delay lock loop analysis.
- 6 (a) Explain about signal acquisition using cell by cell searching.  
(b) Discuss about matched filters for PN sequences.
- 7 (a) What are the general capabilities of spread spectrum signals?  
(b) Discuss about anti-jam considerations.
- 8 (a) Discuss about energy and bandwidth efficiency in multiple access.  
(b) Give specific examples of CDMA digital cellular systems.

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- 1 (a) Give comparison between various modulation systems with neat diagrams.  
(b) Explain about frequency hopping.
- 2 (a) List out the properties of 'm' sequences.  
(b) Explain about antijam characteristics.
- 3 (a) Describe the characteristics of a time hopped signals with neat sketches.  
(b) Discuss about interference rejection in a time hopping receiver.
- 4 (a) Explain about discrete frequency synthesizers.  
(b) Discuss about SAW device PN generators.
- 5 (a) With a neat block diagram explain about non-coherent frequency hop receiver.  
(b) Discuss about coherent carrier tracking.
- 6 (a) Discuss about matched filters for PN sequences.  
(b) Explain how acquisition time is reduced with necessary diagrams.
- 7 (a) Discuss about error correction coding.  
(b) Describe selective calling and identification in multiple accesses.
- 8 (a) Discuss about multiple access considerations.  
(b) With a neat diagram explain about a CDMA digital cellular systems.

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- 1 (a) With examples, distinguish between direct sequence and pseudo noise sequences.  
(b) Explain about time hopping.
- 2 (a) Discuss about partial co-relation of PN signals.  
(b) Discuss the following terms with respect to PN signal:
  - (i) Output signal to noise ratio
  - (ii) Energy BW efficiency
  - (iii) Interference rejection
- 3 (a) Discuss about interference rejection in a frequency hopped receiver.  
(b) Explain about a time hopped signal.
- 4 (a) Explain about shift register sequence generators.  
(b) Discuss about charge coupled devices.
- 5 (a) Explain about Tail-Dither loop.  
(b) Draw the block diagram of a non-coherent frequency hop receiver and explain about its working.
- 6 (a) Explain about matched filters for frequency hopped signals.  
(b) Draw the aiding waveform for matched filters with acquisition.
- 7 (a) Give various examples of spread spectrum systems.  
(b) Discuss about general capabilities of spread spectrum.
- 8 (a) Describe the cellular radio concept with necessary diagrams.  
(b) Draw the block diagram of a CDMA digital cellular system and explain its working.

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Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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- 1 (a) With neat diagram explain about chirp spread spectrum technique.  
(b) Bring out the differences between frequency and time hopping methods.
- 2 (a) Discuss about the classifications of periodic sequences.  
(b) Describe how PN signals obtained from PN sequences.
- 3 (a) Discuss about a frequency hopped signal.  
(b) Explain about interference rejection in time hopped receiver.
- 4 (a) Discuss about SAW device PN generators.  
(b) Explain about digital tapped delay lines.
- 5 (a) Explain about carrier tracking in coherent direct sequence receiver.  
(b) With a block diagram, explain about a coherent direct sequence receiver.
- 6 (a) Describe the signal acquisition with matched filters.  
(b) With neat sketches, explain about matched filters for PN sequences.
- 7 (a) Discuss about antijam considerations.  
(b) Discuss about intercept and miscellaneous considerations.
- 8 (a) With a neat block diagram explain the working principle of a CDMA digital cellular system.  
(b) Give some specific examples of CDMA digital cellular systems.

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