

Code No: 136DW**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year II Semester Examinations, May - 2019****SPREAD SPECTRUM COMMUNICATIONS****(Electronics and Communication Engineering)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Write the classification of direct sequences spread spectrum. [2]
- b) Define code division multiple access. [3]
- c) Explain about frequency hopping. [2]
- d) Explain Delay Locked Loop. [3]
- e) What is initial synchronization? [2]
- f) Explain about spreading code. [3]
- g) List the features of CDMA. [2]
- h) Define mobile channel. [3]
- i) Explain about forward error correction. [2]
- j) Define jammers. [3]

PART - B**(50 Marks)**

- 2.a) Explain the modulation and demodulation of direct sequence spread spectrum. [5+5]
 - b) Discuss the overall direct sequence system with waveforms. [5+5]
- OR**
- 3.a) Compare process gains available for various techniques including signal rejection and cancellation. [5+5]
 - b) With neat block diagram, explain the frequency hopped spread spectrum system model. [5+5]
4. Explain about Double Dither Non-Coherent Tracking Loop. [10]
- OR**
5. Write the concept of Tracking and explain Delay-Lock-Tracking. [10]
 6. Explain briefly synchronization by Estimated the Received Spreading Code. [10]
- OR**
7. Explain Serial Search Synchronization Techniques. [10]
 8. Explain the design of Single-user receiver in a Multi-user channel with respect to CDMA. [10]
- OR**
9. Discuss about multi user detection in CDMA cellular radio. [10]

10. Explain how viterbi algorithm performing maximum-likelihood decoding of convolution codes. [10]

OR

11. Discuss the following:
a) Elementary convolution coding concept.
b) Decoding and Bit-Error Rate. [5+5]

---ooOoo---