

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2021 - 22 Examination

Semester: 8**Date: 28/03/2022****Subject Code: 203107485****Time: 10:30am to 1:00pm****Subject Name: Spread Spectrum Techniques****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Answer the Following.**(15)**

1. The bit rate of PN code is called as _____.
2. The power density of wide band signal is _____.
3. The same channel capacity is maintained even for the lowered value of SNR by increasing the _____.
4. In GPS, high resolution ranging can be obtained by using _____.
5. If the two different PN codes are correlated then their auto correlation function should be _____.
6. _____ are constructed by EXOR-ing two or more m-sequences of the same length with each other.
7. The PN code is generated in a maximal length Shift register, which is nothing but a _____.
8. In DSS, if x-oring operation is performed between the data and PN-code then for logic 1, the output will be _____.
9. Shannon's channel capacity is given by _____.
10. Chip rate of PN code is _____ than bit rate of the signal.
11. DSSS stands for what?
 - (a) Direct sequence spread spectrum
 - (b) Dedicated sequence spread spectrum
 - (c) Degenerative sequence spread spectrum
 - (d) None of these
12. Anti-jamming is the advantage of spread spectrum communication, true or false??
 - (a) True
 - (b) False
13. If the autocorrelation is maximum then the user is authenticated in CDMA, true or false?
 - (a) True
 - (b) False
14. The PN-code must satisfy;
 - (a) Autocorrelation property
 - (b) Run length property
 - (c) Balance property
 - (d) All of these
15. Aperiodic sequences are generally used for synchronization purpose, true or false?
 - (a) True
 - (b) False

Q.2 Answer the following questions. (Attempt any three)**(15)**

- A) Explain the block diagram of FHSS transmitter and receiver in detail.
- B) Compare the different Spread spectrum methods.
- C) Draw and explain general block diagram of DSSS transmitter and receiver.
- D) Explain the RAKE receiver in detail.

Q.3 A) Draw and explain the block diagram of the OFDM system.**(07)**

- B) Explain Multi carrier modulated system (MCM) transmission and reception in detail.

OR

- B) Explain in detail: What is cyclic prefix? Why it is needed?

(08)**Q.4 A) What is pilot carrier? Why it is needed in OFDM? Explain different types of pilot carrier insertion in OFDM.****(07)****OR**

- A) Explain different variants of OFDM in brief.
- B) Briefly explain the frequency domain representation of OFDM system.

(07)**(08)**