

R15

Code No: 126ZN

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2019

DIGITAL 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) | Define Nyquist rate. | [2] |
| b) | What is meant by aliasing effect? | [3] |
| c) | Explain coherent detection? | [2] |
| d) | What is the difference between PSK and FSK? | [3] |
| e) | Define the term ISI? | [2] |
| f) | What is the necessity of equalization? | [3] |
| g) | What is hamming distance? | [2] |
| h) | Define code efficiency. | [3] |
| i) | What is pseudo noise sequence? | [2] |
| j) | What is direct sequence spread spectrum modulation? | [3] |

PART - B

(50 Marks)

- | | | |
|-----------|--|-------|
| 2.a) | Write short notes on: | |
| | i) Granular noise | |
| | ii) Slope overload distortion. | |
| b) | Derive an expression for quantization noise in delta modulation. | [5+5] |
| OR | | |
| 3.a) | Explain the working of a PCM system with a neat block diagram. | |
| b) | Explain companding with A-law and μ -law. | [5+5] |
| 4.a) | Explain with neat diagram BPSK transmitter and receiver. | |
| b) | Give a comparison between DPSK and PSK schemes. | [6+4] |
| OR | | |
| 5.a) | Explain non coherent FSK scheme. | |
| b) | Draw a diagram of ASK transmitter and explain it. | [5+5] |
| 6.a) | Derive an expression for error probability of an optimum filter. | |
| b) | Define information and entropy. | [6+4] |
| OR | | |
| 7.a) | Derive an expression to find the condition for removal of ISI. | |
| b) | Explain how ISI differs from crosstalk? | [6+4] |

8.a) Explain about block codes in which each block of k message bits is encoded into $n > k$ bits with an example.

b) Explain hamming cyclic codes by considering suitable example. [5+5]

9.

Consider a (6, 3) generator matrix.

$$\left[\begin{array}{ccc|ccc} 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{array} \right]$$

a) Find all the code vectors of this data for block codes

b) The parity check matrix for this code.

c) The minimum weight of this code. [10]

10. Give four applications of spread spectrum systems. Explain. [10]

OR

11. What is the use of spread spectrum? Discuss in detail the direct sequence spread spectrum. [10]

---ooOoo---