

**R13**

Code No: 126AN

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech III Year II Semester Examinations, April - 2018**

**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) State Sampling theorem. [2]
- b) Mention the merits of DPCM. [3]
- c) Define ASK. [2]
- d) What is meant by DPSK? [3]
- e) What is intersymbol interference in baseband binary PAM systems? [2]
- f) What is the necessity of adaptive equalization? [3]
- g) What is meant by systematic and non-systematic codes? [2]
- h) What is meant by linear code? [3]
- i) Define spread spectrum communication. [2]
- j) What is frequency hop spread spectrum modulation? [3]

**PART - B**

**(50 Marks)**

- 2.a) Draw the block diagram of digital communication system and explain each block in detail.
  - b) Mention the advantages of digital communication over analog communication. [5+5]
- OR**
- 3.a) Explain the term quantization.
  - b) Find the output signal power due to quantization noise in PCM system. [5+5]

- 4.a) Explain with neat diagram BFSK transmitter and receiver.
- b) Give a comparison between FSK and PSK schemes. [6+4]

**OR**

- 5.a) Explain coherent ASK and non coherent ASK schemes.
  - b) Draw a diagram of DPSK transmitter. [6+4]
- 6.a) Explain how the residual effects of the channel are responsible for ISI.
  - b) Explain about three tap reset equalizer. [5+5]

**OR**

- 7.a) What is nyquist pulse shaping?
- b) Explain the role of cosine roll off spectrum in Nyquist pulse shaping with necessary waveforms and spectra. [5+5]

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- 8.a) What is a convolutional code? How is it generated?  
b) Explain in detail convolutional coder with a suitable example.

[5+5]

OR

9. The parity check bits of an (8, 4) block code are generated by  
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$$C5 = d1 + d2 + d4$$

$$C6 = d1 + d2 + d3$$

$$C7 = d1 + d3 + d4$$

$$C8 = d2 + d3 + d4$$

Where  $d1, d2, d3$  and  $d4$  are message bits. Find

- a) The generator matrix and parity check matrix for this code.  
b) The minimum weight of this code.

[5+5]

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- 10.a) Draw the block diagram of a spread spectrum system.  
b) Explain Frequency hopping spread spectrum.

[5+5]

OR

11. Explain PN sequences generation and characteristics.

[10]

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