

R16

Code No: 135AK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech III Year I Semester Examinations, November/December - 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) What are the advantages of digital communication over analog communication. [2]
- b) What is aliasing and aperture effect and how to eliminate them? [3]
- c) A source generates 4 messages with the probabilities $1/3, 1/6, 1/4, 1/4$. The successive messages limited by the sources are statistically independent. Calculate the entropy of the source. [2]
- d) What are the convolutional codes? Explain. [3]
- e) Write the properties of the matched filter. [2]
- f) What is a correlative level coding? [3]
- g) Compare the bandwidth requirements of (i) BPSK (ii) 8QAM (iii) 8PSK. [2]
- h) For a tri bit input $Q=0, I=0$ and $C=0(000)$. Determine the output phase for 8 PSK modulation. [3]
- i) List the applications of the spread spectrum techniques. [2]
- j) Write the properties of PN sequence. [3]

PART - B**(50 Marks)**

2. Explain the different types of sampling and discuss each technique in detail with neat sketches. [10]
- OR**
- 3.a) Discuss the Delta modulation technique. Also discuss the noises in DM. [5+5]
 - b) Discuss the quantization noise in PCM.
 - 4.a) Explain the Lempel-Ziv coding with an example. [5+5]
 - b) Discuss the Matrix description of the linear bloc codes.
- OR**
- 5.a) The generator polynomial of a (7,4) cyclic code is $G(P)=P^3+P+1$. Obtain all the code vectors for the code in non systematic and systematic form. [5+5]
 - b) State the Shannon Hartley Law and discuss the properties of entropy.

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- 6.a) Discuss the nyquist criteria for distortion less base band binary transmission.
b) Briefly explain the operation of the optimal linear receiver. [5+5]

OR

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- 7.a) What is the principle of the adaptive equalizer ? Draw the structure.
b) Explain the geometric interpretation of the signals. [5+5]

8. Draw the QPSK modulator? And construct the truth table, phasor diagram and constellation diagram for it. [10]

OR

9. Explain the transmitter and receiver section of the DPSK techniques in detail. [10]

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- 10.a) Explain the CDMA techniques.
b) What is the use of the spread spectrum techniques? [6+4]

OR

11. Explain in detail the types of frequency hopping spread spectrum techniques. [10]

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