



**B.E DEGREE EXAMINATIONS: MAY 2015**

(Regulation 2013)

Third Semester

**INFORMATION TECHNOLOGY**

U13ECT314: Principles of Communication

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. The amplitude modulator works on the principle of
  - a) Addition
  - b) Subtraction
  - c) Multiplication
  - d) Division
2. If the carrier of a 100 percent AM wave is suppressed, the percentage power saving will be .....
3. FM can be generated using PM by
  - a) Passing a modulating signal through a LPF
  - b) Passing a modulating signal through a HPF
  - c) Using Pre-Emphasis
  - d) Using De-Emphasis
4. Pre-emphasis in FM systems involves \_\_\_\_\_ of the modulating signal
5. How many phases are transmitted in QPSK?
  - a) 2
  - b) 4
  - c) 8
  - d) 16
6. MSK is basically a \_\_\_\_\_ digital modulation technique
7. The number of quantization level is 512. Calculate the number of bits
  - a) 8 bits
  - b) 18 bits
  - c) 10 bits
  - d) 9 bits
8. Slope overload error in Delta Modulation is reduced by \_\_\_\_\_
9. The shape of Auto Correlation function of PN Sequence is
  - a) Rectangular
  - b) Triangular
  - c) Square
  - d) Circle

10. The spread spectrum occupies a \_\_\_\_\_ bandwidth than that of a normal signal.

**PART B (10 x 2 = 20 Marks)**

**(Not more than 40 words)**

11. Define Modulation Index.
12. What is meant by the repetition rate of the AM envelope?
13. Construct the block diagram for generating.
14. What is Capture Effect in FM?
15. Show the arrangement for non-coherent detection of FSK binary signal.
16. Construct the geometric representation of PSK.
17. What is the relation between signaling rate and Bandwidth?
18. What is meant by Constellation Diagram?
19. Define 'Processing gain' of a Spread spectrum System.
20. Outline the structure of DSS transmitter system.

**PART C (5 x 14 = 70 Marks)**

**(Not more than 400 words)**

**Q.No. 21 is Compulsory**

21. Explain in detail about the generation and coherent detection of QPSK signal (14) with neat block diagram.
  
22. a) i) Derive the equation for AM wave. (4)  
ii) Explain the function of collector modulator with relevant circuit diagram. (10)

**(OR)**

- b) i) Mention the advantages of superheterodyne receiver over TRF receiver? (4)  
ii) Explain the Super heterodyne receiver with suitable block diagram. (10)
  
23. a) i) Explain the working of a reactance modulator. (7)  
ii) Summarize the necessity for AFC in direct FM generation. (7)

**(OR)**

- b) i) Explain the Direct PM modulators with relevant diagrams. (7)  
ii) Outline the Armstrong Indirect FM transmitter with suitable diagrams. (7)
  
24. a) i) State Sampling Theorem for a bandpass signal (4)  
ii) Describe about the Delta Modulation and outline its disadvantages using suitable block diagrams. (10)

**(OR)**

- b) i) What is InterSymbol Interference? Describe with an example. (4)
- ii) Describe about the Nyquist Criteria for distortionless baseband binary transmission. (10)

25. a) i) What is a PN sequence? (2)
- ii) Explain how a maximal length sequence can be generated with suitable diagrams and discuss its properties. (12)

**(OR)**

- b) i) Explain the frequency hopping spread spectrum method with relevant diagrams. (7)
- ii) What are the types of FH spread spectrum? Compare their features. (7)

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