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Question Paper Code	12487
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B.E. / B.Tech - DEGREE EXAMINATIONS, NOV / DEC 2023

Third Semester

Computer Science Engineering

(Common to Information Technology)

20ESEC301 - COMMUNICATION ENGINEERING

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,
K-Level, CO</i> |
|---|-------------------------------|
| 1. Describe the Phasor diagram of AM wave. | 2,K1,CO1 |
| 2. Determine the Nyquist rate for the signal
$x_a(t) = 3 \cos 2000\pi t + 5 \sin 6000\pi t + 10 \cos 12000\pi t .$ | 2,K2,CO1 |
| 3. List the difference between NBFM and WBFM. | 2,K1,CO2 |
| 4. Define frequency modulation. | 2,K1,CO2 |
| 5. Draw the waveform of Bipolar NRZ for the data 10110110. | 2,K2,CO3 |
| 6. What are the drawbacks of Delta Modulation? | 2,K1,CO3 |
| 7. Draw the OOK waveform for the data (01100010). | 2,K2,CO4 |
| 8. What are the parameters used to measure the eye pattern? | 2,K1,CO4 |
| 9. What is the concept of frequency reuse? | 2,K1,CO6 |
| 10. What are the types of multiple access techniques? | 2,K1,CO6 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

- | | |
|---|-----------|
| 11. a) (i) Explain the generation of DSB-SC using ring modulator. | 7,K2,CO1 |
| (ii) With suitable block diagram and equation show how will you generate DSBSC using balanced modulator? | 6,K2,CO1 |
| OR | |
| b) With the help of neat diagram, explain the generation of VSB transmission? Draw VSB spectrum and explain the significance. | 13,K2,CO1 |
| 12. a) Explain in detail about FM generation using indirect method. | 13,K2,CO2 |
| OR | |
| b) (i) Explain about ratio detector and what are the advantages of ratio detector over foster seeley detector. | 7,K2,CO2 |
| (ii) Draw the circuit of reactance tube modulator and explain its principle of operation. | 6,K2,CO2 |

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. a) (i) Explain the generation of Delta Modulation with its waveform. 8,K2,CO3
(ii) What are the drawbacks of DM? Describe about ADM with its advantages and disadvantages. 5,K2,CO3
- OR**
- b) (i) Explain the generation of PCM with its expression. 8,K2,CO3
(ii) With suitable block diagram and equation show the generation of DPCM. 5,K2,CO3
14. a) With the help of neat diagram, explain the generation and detection of ASK. Draw the waveform and explain the significance. 13,K2,CO4
- OR**
- b) Discuss in detail about ISI and its effects. Also give short notes about eye pattern with its waveform. 13,K2,CO4
15. a) With the help of neat diagram, explain the spread spectrum techniques used in wireless communication. 13,K2,CO6
- OR**
- b) Explain in detail about GSM with neat sketch. 13,K2,CO6

PART - C (1 × 15 = 15 Marks)

16. a) A discrete memory less source has five symbols x_1, x_2, x_3, x_4, x_5 with probabilities 0.4, 0.19, 0.16, 0.15, 0.15 respectively attached to every symbol. Construct Shannon-Fano and Huffman coding for the source and calculate code efficiency η . 15,K2,CO5
- OR**
- b) The parity check matrix of a particular (7,4) linear block code is given by 15,K2,CO5

$$H = \begin{bmatrix} 1 & 1 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}$$

- (i) Find the generator matrix G.
(ii) List all the code vectors.
(iii) What is the minimum distance between code vectors?
(iv) How many errors can be detected? How many errors can be corrected?