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Question Paper Code	12916
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Third Semester

Computer Science and 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

- | | Marks | K-
Level | CO |
|---|-------|-------------|-----|
| 1. Draw the frequency spectrum and mention the bandwidth of AM signal. | 2 | K1 | CO1 |
| 2. Distinguish between FM and PM. | 2 | K1 | CO2 |
| 3. Define Nyquist sampling theorem. | 2 | K2 | CO3 |
| 4. What do you mean by slope overload distortion in delta modulation? | 2 | K2 | CO3 |
| 5. Draw ASK and PSK waveforms for a data stream 1010101. | 2 | K1 | CO4 |
| 6. Define inter symbol interference (ISI). | 2 | K1 | CO4 |
| 7. Write the properties of information. | 2 | K1 | CO5 |
| 8. Define channel capacity of discrete memoryless channel. | 2 | K3 | CO5 |
| 9. Give the advantages of spread spectrum over a fixed-frequency transmission? | 2 | K2 | CO6 |
| 10. Compare and comment on the three most commonly used multiple access techniques. | 2 | K2 | CO6 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

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|---|----|----|-----|
| 11. a) Obtain a relationship between carrier and side band powers in an AM DSBFC wave and explain how power distribution takes place in AM DSB FC system. | 13 | 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) Write a note on frequency spectrum analysis of angle modulated waves. | 7 | K2 | CO2 |
| ii) Explain the band width requirements of FM and PM. | 6 | K2 | CO2 |
| 13. a) With neat block diagram, describe the transmitter and receiver of adaptive delta modulation system. | 13 | K2 | CO3 |

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

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OR

- b) Explain the process of quantization and its types in detail. 13 K3 CO3
14. a) Write a note on QPSK modulator & demodulator. Draw its phasor and constellation diagram. Also, explain bandwidth considerations of QPSK. 13 K3 CO4
- b) i) Draw the Eye pattern and indicate how ISI is measured from it. 8 K3 CO4
ii) Compare various digital modulation schemes. 5 K3 CO4
15. a) Describe the frequency hopping spread spectrum technique in detail. 13 K3 CO6

OR

- b) Describe the application of CDMA in wireless communication system. List the advantages of CDMA over TDMA. 13 K3 CO6

PART - C (1 × 15 = 15 Marks)

16. a) Five source messages are probable to appear as $m_1 = 0.4, 0.15, 0.15, 0.15, 0.15$. Find coding efficiency using Shannon's Fano coding and Huffman coding and also compare the efficiency. 15 K3 CO5

OR

- b) The generator polynomial of (15,11) Hamming code is given by $1+X+X^2$. Determine encoder and syndrome calculator for this code using systematic codes. 15 K3 CO5