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Question Paper Code : 20361

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Third/Fourth Semester

Computer Science and Engineering

CS 6304 — ANALOG AND DIGITAL COMMUNICATION

(Common to Biomedical Engineering, Information Technology)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate between Amplitude and Frequency Modulation.
2. Define Modulation Index.
3. State the significance of constellation diagram?
4. What is bandwidth efficiency?
5. Mention the advantages of digital transmission.
6. What is the principle of pulse modulation?
7. State Shannon's fundamental theorem of information theory.
8. Define Hamming distance (HD).
9. List the features of Hand off Technique.
10. What is the advantage of cell splitting concept?

PART B — (5 × 13 = 65 marks)

11. (a) Explain the operation of Super heterodyne receiver.

Or

- (b) Explain the principle of AM modulation with mathematical analysis. Draw the AM wave and explain its power distribution.

12. (a) Draw the block diagram of QPSK modulator, demodulator and explain the principle of operation.

Or

- (b) Describe the basic principle of Quadrature amplitude modulation. Compare shift keying Techniques with QAM.

13. (a) Explain Pulse Code Modulation System with the help of block diagram.

Or

- (b) (i) Draw the block diagram of Data Communication system and explain. (8)

- (ii) What is the need for error detection and correction Techniques? (5)

14. (a) Consider a (5, 1) linear block code defined by the generator matrix $G = [1\ 1\ 1\ 1\ 1]$

- (i) Find the parity check matrix H of the code in systematic form. (2)

- (ii) Find the encoding table for the linear block code. (2)

- (iii) What is the minimum distance d_{min} of the code. How many errors can the code detect. How many errors can the code correct. (2)

- (iv) Find the decoding table for the linear block code (consider single bit errors only). (4)

- (v) Suppose $c = [1\ 1\ 1\ 1\ 1]$ is sent and $r = [0\ 1\ 1\ 1\ 1]$ is received. Show how the code can correct this error. (3)

Or

- (b) What is source coding? Explain the steps involved in Shannon Fano coding with suitable example.

15. (a) Draw and explain the architecture of GSM.

Or

(b) Explain in detail the principle and operation of a CDMA system.

PART C — (1 × 15 = 15 marks)

16. (a) (i) What are the Types and benefits of shift keying Techniques? (5)

(ii) Explain the process of Locating Co-channel Cells in a Cellular Network. (10)

Or

(b) (i) Compare the bit error rate performance for PSK, DPSK and FSK. (5)

(ii) With the help of an example, explain Viterbi Convolutional Decoding Algorithm. (10)

