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Question Paper Code : 40441

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Third / Fifth Semester

Biomedical Engineering

EC 8394 – ANALOG AND DIGITAL COMMUNICATION

(Common to Computer and Communication Engineering /
Medical Electronics / Information Technology)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. In an AM transmitter, the carrier power is 200 W and the modulation index is 0.5. Calculate the total RF power delivered.
2. What is carson's rule?
3. Write the function of UART.
4. Summarize the important advantages of PCM.
5. What is QAM?
6. Compare ASK and PSK.
7. Calculate the entropy of four possible messages {Q1, Q2 and Q3} which is transmitted with probability {1/2, 1/4, 1/4}.
8. Define Hamming Distance.
9. What is Handoff?
10. List the three most commonly used multiple accessing schemes.

PART B — (5 × 13 = 65 marks)

11. (a) With the help of mathematical expression explain about amplitude modulation, its generation and detection. (13)

Or

- (b) Discuss about the Armstrong indirect method of FM generation. (13)

12. (a) Explain the pulse code modulation system with the help of necessary diagrams. (13)

Or

- (b) Discuss in detail about the RS-232 interface. (13)

13. (a) Explain the working of BPSK transmitter and receiver with necessary equation and block diagram. (13)

Or

- (b) Draw the constellation diagram of QPSK modulation and explain QPSK modulation and demodulation. (13)

14. (a) Consider a discrete memory less source with five different symbols with their respective probabilities as 0.4, 0.2, 0.2, 0.1 and 0.1. Encode the source using Huffman coding and find the coding efficiency. (13)

Or

- (b) Write detailed notes on:

(i) Mutual information and its properties. (5)

(ii) Cyclic codes and its properties. (8)

15. (a) Explain the architecture of GSM with a neat diagram. (13)

Or

- (b) Elucidate the principle and operation of a CDMA system. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Explain the various multiple access techniques in detail. (15)

Or

- (b) The below figure shows the encoder rate $r = 1/2$, constraint length $K = 4$ convolutional code. Determine the encoder output produced by the message sequence 10111.... (15)

