**May 2024**

**M.Tech. (ECE) II Semester**

**Advance Digital Communication (MECE-208)**

Time : 3 Hours]                                    [Max. Marks : 75

*Instructions :*

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*

2. *Answer any four questions from Part-B in detail.*

3. *Different sub-parts of a question are to be attempted adjacent to each other.*

### PART–A

1. (a) Define bi-orthogonal signals. Give any two applications. (1.5)

   (b) What is QAM? Give its merits. (1.5)

   (c) What is meant by DPSK? Give its benefits and applications. (1.5)

   (d) Make differences between PAM and PPM. (1.5)

   (e) Define Matched filter. Give its advantages for digital communication. (1.5)

   (f) What is MAP detection? Give its benefits. (1.5)

(g) Define ISI. Give its role and significance in digital communication. (1.5)

(h) What is meant by AWGN channel? Give its any two salient features. (1.5)

(i) Define BER. Give its significance in digital communication. (1.5)

(j) What is Synchronization? Give any two salient features of MMSE technique. (1.5)

## PART–B

2. (a) Draw block diagram of digital communication system and explain its different modules. (10)

(b) Briefly explain Gram-Schmidt orthogonalization procedure and its significance. (5)

3. (a) Make comparisons between PSK and FSK. (5)

(b) Define CPM and GMSK. Briefly explain the concept of QPSK and its variants. (10)

4. What is correlator-demodulator? Explain in detail working of square-law and envelope detection. Also give significance of symbol error rate. (15)

5. (a) What is meant by partial response signaling? Give its significance. (5)

(b) Define Nyquist pulse. Explain operation of duobinary and modified duobinary pulses in digital communication. (10)

6. (a) Explain the design of transmitting and receiving filters for a time varying channel (equalization). (10)

(b) What are Band-limited channels? Discuss symbol and sequence detection. (5)

7. Discuss in detail ML and Spectral line synchronization techniques for digital communication. (15)

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