

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) II Semester (Old) Examination, April / May 2013

Subject: Digital Communication Systems

Time: 3 Hours

Max.Marks: 75

Note : Answer all questions from Part A. Answer any Five questions from Part B.**PART – A (25 Marks)**

1. What are the advantages and disadvantages of digital communication systems? (3)
2. What are the advantages of DM over PCM? (2)
3. Define information and entropy. (2)
4. Explain the source coding theorem. (3)
5. Define BCH codes. (3)
6. Explain the necessity of error control coding. (3)
7. Draw the block diagram of a coherent receiver scheme. (2)
8. Explain the principle of DPSK demodulator. (2)
9. Draw the block diagram of frequency hopping spread spectrum system. (2)
10. List the properties of PN sequence. (3)

PART – B (50 Marks)

- 11.(a) A PCM system uses a uniform quantizer followed by a 7 bit binary encoder.
The bit rate of the system is equal to 50×10^6 bits/sec.
(a) What is the maximum message bandwidth? (3)
(b) Determine the signal to quantization noise ratio when $F_m = 1$ MHz is applied. (4)
(b) Explain the slope overload error in DM. (3)
12. Explain joint and conditional entropy in detail. (10)
13. Consider a systematic block code whose parity check equations are:

$$P_1 = m_1 + m_2 + m_4 \quad P_2 = m_1 + m_3 + m_4$$

$$P_3 = m_1 + m_2 + m_3 \quad P_4 = m_2 + m_3 + m_4$$
 (i) Find the generator matrix and parity check matrix for the code. (4)
 (ii) Is the vector 10101010 a code vector? (3)
 (iii) Is the vector 01011100 a code vector? (3)
14. Explain DPSK with neat block diagram using example. (10)
- 15.(a) Explain the generation of PN sequence. (5)
(b) Explain acquisition schemes for spread spectrum receivers. (5)
- 16.(a) Explain encoding and decoding of cyclic codes using shift registers. (6)
(b) Explain about synchronization methods. (4)
17. Write short notes on the following:
(a) TDM (3)
(b) ASK (3)
(c) M-ary signaling schemes (4)
