



Name :

Roll No. :

Invigilator's Signature :

CS/M.Tech (MCNT)/SEM-1/MC-103/2010-11

2010-11

ADVANCED DIGITAL COMMUNICATION & CODING

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP - A

1. Write short notes on any *four* of the following : $4 \times 5 = 20$

- a) Interleaver
- b) Convolution code
- c) Asynchronous CDMA
- d) OQPSK modulation
- e) QAM modulation
- f) Viterbi decoder.



GROUP - B

Answer any *five* questions.

- | | | | |
|----|----|---|---|
| 2. | a) | What is equalization ? What is Nyquist criterion ? | 3 |
| | b) | How does adaptive equalization work ? | 3 |
| | c) | Derive LMS algorithm. | 4 |
| 3. | a) | What is matched filter ? | 2 |
| | b) | Derive matched filter equation ? | 5 |
| | c) | What is correlator detector ? | 3 |
| 4. | a) | Write about DPSK modulator. | 4 |
| | b) | Write about DPSK demodulator. | 4 |
| | c) | What is its BER ? | 2 |
| 5. | a) | What is MSK ? | 2 |
| | b) | Write about MSK modulator. | 4 |
| | c) | Write about MSK demodulator. | 4 |
| 6. | a) | What is spread spectrum ? What are its advantages and disadvantages ? | 3 |



- b) What is CDMA ? 2
- c) What is the decorrelating detector for 3 synchronous user ? Derive. 5
7. a) What is FHSS ? 2
- b) How to implement FHSS ? Give a drawing. 4
- c) Draw a schematic diagram for FHSS. 4
8. a) Let $a(x) = x^3 + x + 1$ and $b(x) = x^2 + x + 1$ be defined over GF(2). What will be $\frac{a(x)}{b(x)}$ the quotient and residue. 3
- b) Consider the ring $F(x)/(x^2 + x + 1)$ defined over GF(2). What will be its elements ? Find addition and multiplication table. 5
- c) Is $F[x]/(x^2 + x + 1)$ a field ? 2
