Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.Tech(MCNT)-OLD/SEM-1/MC-103/2011-12

2011

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 *two* of the following : $2 \times 5 = 10$

a) Match filter

b) Optimum filter

c) $\frac{\pi}{4}$ QPSK modulation

d) GSM.

GROUP – B

Answer any *five* questions. 5 x 12 = 60

2. a) Draw the schematic diagram for modulation and demodulation for BFSK. What will be the BER ? 6

   b) Draw the schematic diagram for modulation and demodulation for MSK. What will be the BER ? 6

3. a) What will be the modulation and demodulation scheme for M-ary PSK ? What will be the BER ? 6

   b) What will be modulation and demodulation scheme for M-QAM ? What will be the BER ? 6

4. a) Write a short note on synchronous CDMA modulation and Optimum demodulation. 5

   b) Write how to improve on optimum demodulation by using Decision Feedback Cancellation scheme. 7

5. a) How to model a Rayleigh faded channel with a vehicular speed of v ? 6

   b) How to model a frequency selective channel ? 6

6. a) What is ISI ? How to equalize the channel by adaptive methods ? 5

b) Derive the LMS adaptation law for decision direct mode. 7

7. a) What are *m*-sequence and Gold sequences ? Write the properties of *m*-sequence. 6

b) Find the *m*-sequence and Gold sequences for the polynomials $g(x) = x^5 + x^4 + x^2 + x + 1$ and $g(x) = x^5 + x^2 + 1$. 6