J.N.N. College of Engineering Shimoga 577204
Department of Electronics & Communication Engineering
III Semester M. Tech. (DECS)
I Test

Subject: Error Control Coding - 10EC039 Max Marks: 25
Date: 30 -09-2013 Time: 3-00 To 4-00 PM

Answer any TWO full questions

1. (a) Define a field and construct modulo 7 addition and multiplication table for GF(2). **6 Marks**

   (b) Mention the Golay decoding steps. **6.5 Marks**

2. (a) Prove any irreducible polynomial over GF(2) of degree m divides $X^{2^m-1}+1$ with an example. **6.5 Marks**

   (b) List the specifications of Reed-Muller code. Obtain all possible code words for $RM(2,4)$. **6 Marks**

3. (a) Consider a systematic (7, 4) linear block code whose parity matrix P is given by

$$P = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$$

   i) Find all possible valid code vectors ii) Draw the corresponding encoding and syndrome circuit for this code. iii) Determine error detection and correction capabilities for this code. **10 Marks**

   (b) Mention the GOLAY code P matrix properties. **2.5 Marks**

All the best