Quiz 3 for Topics in Coding Theory 2021

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7+3 = 10 marks.

1. Let the code considered be RM(5,2) code. Received vector is as follows (given in blocks of 4 bits for you to parse easily).

   $$(1001, 1001, 1011, 0110, 1010, 1001, 1001, 1110)$$

   Note: The order of enumeration of vectors in the coordinate indices of codeword is as follows $(X_1, X_2, X_3, X_4, X_5)$ runs from

   $$(00000), (00001), (00010), ..., (11111).$$

   (giving 32 indices).

   Determine the coefficients of the following monomials - (a) X_2X_3 (b) X_4 in the message polynomial for the above received vector via Reed's Majority logic algorithm. (Note: to answer (b), you can assume other 2-degree monomials apart from X_2X_3 have coefficient 0)

2. Show that the RM(m,r) code is linear.