Institut für Mathematische Optimierung
TU Braunschweig

SS 2006

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Coding Theory / Discrete Mathematics II
Assignment 6 (June 15, 2006)

(This assignment is due on June 22, 2006, 1.00 p.m., by dropping it into the wooden box **in front of** F 310)

Exercise 1 (Linear code):
Which of the following codes are linear codes?

(a) $C_1 = \{101, 111, 011\}$

(b) $C_2 = \{000, 001, 010, 011\}$

(c) $C_3 = \{0000, 1001, 0110, 1111\}$

(d) $C_4 = \{00000, 11100, 00111, 11011\}$

(e) $C_5 = \{000000, 101010, 010101, 111111\}$

(10 Points)

Exercise 2 (Theorem 4.1):

Prove Theorem 4.1.

(30 Points)

Exercise 3 (Linear span):

(a) Determine the code $C =< S >$ that is generated by $S = \{0100, 0011, 1100\}$.

(b) Let $S = \{0110, 1010, 1100, 0011, 1111\}$. Determine a smallest subset $\overline{S} \subseteq S$ such that $< \overline{S} >=< S >$.

(20 Points)