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Student number: | | | | | | | |

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Instruction group:

- ☐ Group Erik de Vink, AUD 9
- ☐ Group Jerry den Hartog, AUD 10
- ☐ Group Jaap van der Woude, AUD 11
- ☐ Group Tom Verhoeff, AUD 14
- ☐ Group Wieger Wesselink, AUD 15

Interim test Discrete Structures 2IT50, October 5, 2016

This interim test is the second of three, of which the best two count for 30% of the final grade. It consists of three problems with the indicated weights.

In giving proofs you may use theorems and lemmas from the lecture notes (not exercises), as long as you indicate that you use them.

The problems may be solved either in English or in Dutch, please write your answer on this paper in the indicated boxes.

This test will be graded according the given percentages.

Problem 1.

(20 %) Draw an undirected graph with 6 nodes all having degree 3, that admits a Hamilton cycle. Indicate this Hamilton cycle.

Problem 2.

(40 %) Let $G = (V, E)$ be a connected undirected graph, and $u, v, w \in V$ be three distinct nodes for which $\{(u, v), (u, w), (v, w)\} \subseteq E$. Prove that the graph $H = (V, E \setminus \{(u, v)\})$ is connected too.

Problem 3.

(40 %) Let A be a finite set and $f, g : A \to A$ two functions for which $f \circ g$ is surjective. Prove that both f and g are injective.

(extra paper)

(scrap paper)