

## Algebraic K-Theory

Summer term 2011

Exercise sheet 13

Lück / Wegner

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**Exercise 37:**

- a) Compute  $K_n(\mathbb{Z}[\mathbb{Z}^m])$  and  $\text{Wh}(\mathbb{Z}^m)$  for all  $n \leq 1$  and  $m \geq 0$ .
- b) Compute  $K_n(\mathbb{Z}/42)$  and  $K_n(\mathbb{Z}/43)$  for all  $n \leq 1$ .

**Exercise 38:**

Let  $(R_i)_{i \in I}, (\theta_{i,j}: R_i \rightarrow R_j)_{i \leq j}$  be a directed system of rings (with unit) and let  $R := \varinjlim R_i$  be the direct limit. Prove that  $K_n(R)$  is isomorphic to  $\varinjlim K_n(R_i)$  for all  $n \leq 1$ .

**Exercise 39:**

Let  $G$  be a group. Show that there is an isomorphism

$$\text{Wh}(G \times \mathbb{Z}) \cong \tilde{K}_0(\mathbb{Z}G) \oplus \text{Wh}(G) \oplus NK_1(\mathbb{Z}G) \oplus NK_1(\mathbb{Z}G).$$

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Please hand in your solutions at Christian Wegner's office (room 3.022) by **Monday, July 11th**. (Slide your solutions under the door if the room is locked.)

Examination date (oral exam): Monday, July 18th and Tuesday, July 19th.

[http://www.math.uni-bonn.de/people/wegner/lehre\\_SS2011/K-theory/](http://www.math.uni-bonn.de/people/wegner/lehre_SS2011/K-theory/)