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TOPOLOGICAL ALGEBRAS–SS 2018

Recap Sheet 6

This recap sheet aims to self-assess your progress and to recap some of the definitions and concepts introduced in the previous lectures. You do **not** need to hand in solutions, but please try to answer as many questions as you can since this is a very good training in preparation of your final exam. If you should have any problem, please do not hesitate to attend Maria's office hours on Thursdays 2-3 pm in room F408.

- 1) State the Arens-Michael decomposition theorem.
- 2) How are the factor-Banach algebras in the Arens-Michael decomposition constructed?
- 3) What are the benefits of the Arens-Michael decomposition in the study of lmc algebras?
- 4) Give the definition of π -topology on the tensor product of two lc TVS and characterize this lc topology in terms of basis and in terms of seminorms.
- 5) Recall the definition of symmetric algebra and give an example of a commonly used algebra, which can be constructed as a symmetric algebra over some vector space.
- 6) Recall the construction of the projective extension of a seminorm on a vector space V to the symmetric algebra S(V). Which important property does this projective extension have?
- 7) What is a natural topology to put on the symmetric algebra S(V) given an lc TVS (V, τ) ?
- 8) Is it always possible to linearly extend a continuous linear functional on a seminormed space (V, p) to the symmetric algebra S(V) such that continuity is preserved? Justify your answer!
- 9) Formulate the K-moment problem for unital commutative \mathbb{R} -algebras.
- 10) State the generalized Riesz-Haviland theorem. Why is this theorem an impractical solution to the K-moment problem?