natural invariant for distiguishing algebras is present. A. Connes showed that all possible subgroups occur in practice by forming a new crossed product algebra out of an algebra and a given automorphism group of the algebra. M. Takesaki then showed that every type III algebra is the crossed product of a type II_∞ algebra with a one-parameter automorphism group.

Now the problem of classifying von Neumann algebras reduces to that of classifying type II_1 algebras. Some important strides have already been made by A. Connes again by studying automorphism groups.

The main feature and value of the book *Lectures on von Neumann algebras* is the discussion in Chapters 9 and 10 of modular automorphisms, Hilbert algebras, modular Hilbert algebras and self-polar forms. These are developed for normal semi-finite weights in a manner that parallels the development for quasi-unitary algebras from traces. (The prototype for this is M_n acting on the Hilbert space M_n.) Included is a complete discussion of the theory of closed operators on Hilbert space that is necessary for the discussion of the modular operator. The discussion lacks a little of the clarity of earlier chapters in that much information is carried in general discussion paragraphs rather than in definitions or theorems. Yet the value of having the information all in one place with one set of notation is certainly very great.

The discussion concerning different types of von Neumann algebras is limited to the definition of the different types of algebras and the definition of their basic properties as found in other texts. Connes' classfication of factors is discussed briefly in the appendix of Chapter 10. In fact, two sections (a section E and C) are appended to each chapter: The first being exercises or additional theorems that the reader has a chance of doing for himself and the second being additional related topics that are briefly discussed.

There is no discussion of abelian von Neumann algebras or direct integrals.

Finally, the bibliography has over 120 pages.

Reports of new books on von Neumann algebras and C^*-algebras are circulating. In particular, books from R. V. Kadison and J. Ringrose, from M. Takesaki and from G. K. Pedersen are expected shortly.

HERBERT HALPERN

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Principles of optimal control theory, by R. V. Gamkrelidze, Mathematical Concepts and Methods in Science and Engineering, Vol. 7, Plenum Press, New York, 1978, xii + 175 pp.

The present book is an account of lectures given at Tblissi State University. It is an excellent exposition of mathematical principles underlying Optimal Control Theory. In particular the author derives the maximum principle and establishes basic existence theorems for a special but typical optimal control problem. One of the outstanding features of the book is the clear presentation of the concept of relaxed or generalized controls which play such an important role in Optimal Control Theory.