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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% LIST OF THEOREMS FOR THE EXAM %%%%%%%%%%%%%%%%%%%%%%%%
% Explanation:
%  the number at the end of line = the number of the theorem in the lecture notes
%  the sign before the number:
%        *   these theorems are not explicitly included into
%            the exam questions.  Anyway, the knowledge is assumed,
%            including the idea of a proof (in case the theorem
%            was proved during the lectures).
%
%         +  hard theorems included to exam questions
%
%  no sign   easy theorems included to exam questions
%
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%%% Chapter X

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adding a unit to a Banach algebra % X.2
renorming a Banach algebra % * X.3
on multiplication of invertible elements % X.5
Neumann's series and properties of the group of invertible elements % X.6 and X.7
properties of the resolvent function % + X.8
nonemptiness of spectrum % + X.9
Gelfand-Mazur theorem % X.10
spectrum and polynomials % X.11 and X.12
formula for the spectral radius % + X.13
on spectrum with respect to a subalgebra % + X.15 and X.16
path integral with values in a Banach space % * X.17
holomorphic functional calculus % + X.18
properties of ideals and maximal ideals % X.19
factorization of a Banach algebra % X.21
properties of complex homomorphisms and $\Delta(A)$ % X.22 and X.23
on maximal ideals and complex homomorphisms % IV.24
Gelfand transform and its properties % + IV.25

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%%% Chapter XI

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basic properties of algebras with involution % XI.2
on spectral radius of a normal element in a C^*-algebra % XI.3 and XI.4
adding a unit to a C^*-algebra % * XI.5
automatic continuity of $*$-homomorphisms % XI.6
spectrum of a self-adjoint element % XI.8
Gelfand-Neimark theorem % XI.9
on one-to-one $*$-homomorphisms % * XI.11
spectrum with respect to a C^*-subalgebra % XI.12
Fuglede theorem % * XI.13
continuous functional calculus in unital C^*-algebras % + XI.14
continuous functional calculus in non-unital C^*-algebras % * XI.15
characterization of unitary elements and operators % XI.17 and XI.18
characterization of orthogonal projections % XI.20
characterization of partial isometries % XI.21

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%%% Chapter XII

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on subsets of the spectrum % * XII.1
properties of the numerical radius % XII.3 including XII.2
structure of normal operators % XII.4

spectrum of a self-adjoint operator % XII.5
polar decomposition % XII.6
on closed and closable operators % XII.10 including XII.8
on the inverse of a closed operator % XII.13
properties of the resolvent set, resolvent function and spectrum of an unbounded operator % XII.14
on operators with empty spectrum % XII.15
on the adjoint operator % * XII.16
basic properties of adjoint operators % * XII.17
on kernel and range % XII.18
on the graph of the adjoint operator % XII.19
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properties of symmetric operators % XII.23
spectrum of a self-adjoint operator % XII.25, including XII.24
characterization of self-adjoint operators among symmetric ones % XII.26
properties of the Cayley transform % XII.27
on the range of the Cayley transform % XII.29 including XII.28
Cayley transform for self-adjoint operators % XII.30
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%%% Chapter XIII
%
Lax-Milgram lemma % * XIII.1
spectral measure of a normal operator % + XIII.2 including the construction
construction and properties of the measurable calculus % + XIII.4 including the construction
properties of an abstract spectral measure % XIII.6
integral of a bounded function with respect to a spectral measure % + XIII.8
integral of an unbounded function with respect tor a spectral measure % + XIII.11
properties of $\int f dE$ (for f possibly unbounded) % * XIII.12
spectrum of $\int f dE$ % XIII.13
spectral decomposition of a bounded normal operator % XIII.9 and XII.10
spectral decomposition of a self-adjoint operator % XIII.15, XIII.16 and XIII.17
on T^*T % * XIII.19
on normal unbounded operators % * XIII.20
spectral decomposition of an unbounded normal operator % * XIII.21
diagonalization of a normal operator % * XIII.24 and XIII.25
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