

Contents

Series Editor's Preface

v

Chapter 0. General information on $C_p(X)$ as an object of topological algebra. Introductory material	1
1. General questions about $C_p(X)$	1
2. Certain notions from general topology. Terminology and notation	4
3. Simplest properties of the spaces $C_p(X, Y)$	9
4. Restriction map and duality map	11
5. Canonical evaluation map of a space X in the space $C_p C_p(X)$	16
6. Nagata's theorem and Okunev's theorem	22
Chapter I. Topological properties of $C_p(X)$ and simplest duality theo-	25
1. Elementary duality theorems	25
2. When is the space $C_p(X)$ σ -compact?	28
3. Čech completeness and the Baire property in spaces $C_p(X)$	31
4. The Lindelöf number of a space $C_p(X)$, and Asanov's theorem	33
5. Normality, collectionwise normality, paracompactness, and the extent of $C_p(X)$	36
6. The behavior of normality under the restriction map between function spaces	43
Chapter II. Duality between invariants of Lindelöf number and tightness type	45
1. Lindelöf number and tightness: the Arkhangel'skiĭ—Pytkeev theorem	45
2. Hurewicz spaces and fan tightness	48

3. Fréchet—Urysohn property, sequentiality, and the k -property of $C_p(X)$	51
4. Hewitt—Nachbin spaces and functional tightness	57
5. Hereditary separability, spread, and hereditary Lindelöf number	66
6. Monolithic and stable spaces in C_p -duality	76
7. Strong monolithicity and simplicity	83
8. Discreteness is a supertopological property	87
 Chapter III. Topological properties of function spaces over arbitrary compacta	91
1. Tightness type properties of spaces $C_p(X)$, where X is a compactum, and embedding in such $C_p(X)$	91
2. Okunev's theorem on the preservation of σ -compactness under t -equivalence	97
3. Compact sets of functions in $C_p(X)$. Their simplest topological properties	102
4. Grothendieck's theorem and its generalizations	106
5. Namioka's theorem, and Pták's approach	115
6. Baturov's theorem on the Lindelöf number of function spaces over compacta	121
 Chapter IV. Lindelöf number type properties for function spaces over compacta similar to Eberlein compacta, and properties of such compacta	125
1. Separating families of functions, and functionally perfect spaces	125
2. Separating families of functions on compacta and the Lindelöf number of $C_p(X)$	131
3. Characterization of Corson compacta by properties of the space $C_p(X)$	136
4. Resoluble compacta, and condensations of $C_p(X)$ into a Σ_+ -product of real lines. Two characterizations of Eberlein compacta	144
5. The Preiss—Simon theorem	152
6. Adequate families of sets: a method for constructing Corson compacta	156
7. The Lindelöf number of the space $C_p(X)$, and scattered compacta	164

8. The Lindelöf number of $C_p(X)$ and Martin's axiom	168
9. Lindelöf Σ -spaces, and properties of the spaces $C_{p,n}(X)$	174
10. The Lindelöf number of a function space over a linearly ordered compactum	181
11. The cardinality of Lindelöf subspaces of function spaces over compacta	185
Bibliography	193
Index	203