

CONTENTS

PREFACE

vii

CHAPTER 1 PRELIMINARIES

§ 1.1. Semi-continuous functions	1
§ 1.2. Measure and integral	7
§ 1.3. The space \mathbb{R}^p	15
§ 1.4. Approximation by smooth functions	21
§ 1.5. Vague convergence	25
§ 1.6. Ultraspherical polynomials	27
§ 1.7. Pizzetti's formula	30

CHAPTER 2 SUPERHARMONIC, SUBHARMONIC AND HARMONIC FUNCTIONS IN \mathbb{R}^p

§ 2.1. Superharmonic and subharmonic functions	33
§ 2.2. Laplacians	40
§ 2.3. The Poisson integral	43
§ 2.4. The Blaschke-Privalov operators	51
§ 2.5. Approximation by smooth functions	54
§ 2.6. The Riesz Decomposition	58
§ 2.7. Expansion of a function harmonic in an annulus	62
§ 2.8. Behaviour at ω	67

CHAPTER 3 THE CONDUCTOR PROBLEM AND CAPACITY

§ 3.1. The Riesz composition formula	71
§ 3.2. The Riesz fractional integral	73
§ 3.3. The Riesz potentials	77
§ 3.4. Charges of finite energy	80
§ 3.5. The conductor problem	94
§ 3.6. Capacity	105
§ 3.7. Generalised capacity	112

CHAPTER 4

THE DIRICHLET PROBLEM

§ 4.1. Abstract harmonic functions	117
§ 4.2. Hyper- and hypoharmonic functions	123
§ 4.3. Saturated sets	129
§ 4.4. More about solution functions	135
§ 4.5. Behaviour at the boundary	144
§ 4.6. Polar sets and thin sets	148
§ 4.7. The Laplace case for \mathbb{R}^p	159
§ 4.8. The Laplace case for $\overline{\mathbb{R}}^p$	109
REFERENCES	175
INDEX	176