## **Contents**

$\boldsymbol{P}$	reface		vii
1	The	second order system of equations	1
	1.1	Statement of the boundary-value problem	1
	1.2	* *	2
	1.3	Properties of the constants occurring in the basic	
		equations	4
	1.4	Uniqueness of solution	12
2	Physical problems governed by the system		
	2.1	Introduction	14
	2.2	Laplace's equation	14
	2.3	Generalized plane thermostatics for anisotropic materials	16
	2.4	Generalized plane deformations of anisotropic elastic materials	17
	2.5	Properties of the constants occurring in the elastic equations	19
	2.6	Quasi-static deformations of anisotropic elastic materials	25
	2.7	Transversely isotropic and orthotropic materials	26
3	Вош	ndary-value problems	30
	3.1	Introduction	30
	3.2	First problem for a half-plane	30
	3.3	Second problem for a half-plane	31
	3.4	Mixed boundary-value problem for a half-plane I	33
	3.5	Mixed boundary-value problem for a half-plane II	35
	3.6	A particular class of mixed boundary-value problems	36
	3.7	Problem for the cut plane	41
	3.8	Two dissimilar half-planes with a cut along the join	44
	3.9	Boundary-value problems for a strip	47
	3.10	Problem for the cut strip	49
	3.11	Problem of a cut strip between two half-planes	54

4	Som	e problems in elasticity and thermostatics	59
	4.1	Prescribed temperature on the boundary of a half-space	59
	4.2	Prescribed heat flux on the boundary of a half-space	61
	4.3	An anisotropic elastic half-space with specified boundary	
		tractions	63
	4.4	Mixed thermostatic problems for a half-space	65
	4.5	Mixed elastostatic problems for a half-space	66
	4.6	Temperature field round a crack	68
	4.7	Stress field round a crack in an anisotropic material	69
	4.8	A crack between dissimilar anisotropic media	72
	4.9	Temperature field in a slab	75
		Deformations of an anisotropic elastic slab Temperature field in a cracked slab	77
		Deformations of a cracked anisotropic slab	81
		Stress field in an anisotropic layered material with a crack	84 89
		The motion of a cylinder on an anisotropic half-space	95
		A rolling cylinder on an anisotropic half-space	100
5		• •	
3		ular solutions to boundary-value problems	109
	5.1 5.2	Introduction  Fundamental singular solution	109
	5.3	Fundamental singular solution First problem for a half-plane	109 110
	5.4	Second problem for a half-plane	111
	5.5	Mixed boundary-value problems for a half-plane	112
	5.6	Problem for the cut plane	118
	5.7	Problem for a strip between two parallel lines	119
6		ndary integral equations	122
6			
	6.1	Introduction	122
	6.2	A reciprocal theorem	122
	6.3 6.4	The boundary integral equation for the general problem	123
	6.5	A particular class of boundary-value problems A particular class of mixed boundary-value problems	125 127
	6.6	The boundary integral equation for a region with a cut	131
	6.7	The boundary integral equation for a region with a cut.  The boundary integral equation for a strip	131
7			
7		lications of the boundary integral equations	135
	7.1	Introduction	135
	7.2	Some boundary-value problems for Laplace's equation	135
	7.3	A particular class of problems for Laplace's equation	141
	7.4	Problems for a region with a cut	145
	7.5	Some problems in anisotropic thermostatics	151
	7.6	Some problems in anisotropic elasticity	155 158
Bibliography			
Inc	Index		