

C O N T E N T S

CHAPTER No.	TITLE	PAGE No.
1	A REVIEW OF ELECTROMAGNETIC ^I MODE ANALYSIS OF PLANAR OPTICAL WAVEGUIDES	1 - 27
1.1	Introduction	1
1.2	Maxwell's Equations	4
1.3	Plane Electromagnetic Waves in Unbounded Media	5
1.4	Plane Electromagnetic Waves in Bounded Media	9
1.4.1	Propagation of Electromagnetic Waves in Waveguides	12
1.4.2	Mode Treatment of Asymmetric Dielectric Slab Waveguide	14
1.5	Summary	25
	Bibliography	27
	Figures (1.1 - 1.5)	
2	PROPAGATION CHARACTERISTICS OF MULTILAYER SLAB WAVEGUIDES	28 - 47
2.1	Introduction	28
2.2	Four-layer Asymmetric Slab Theory	32
2.3	Five-layer Symmetric Slab Theory	34

CHAPTER No.	TITLE	PAGE No.
2.4	Two-Dimensional Parabolic-index Media	37
2.4.1	Electromagnetic Mode Treatment of Parabolic-index Media	38
2.5	Summary	45
	References	46
	Figures (2.1 - 2.5)	
3	ELECTROMAGNETIC MODE ANALYSIS OF PLANAR OPTICAL WAVEGUIDE WITH NEARLY PARABOLIC REFRACTIVE INDEX PROFILE	48 - 79
3.1	Introduction	48
3.2	Electromagnetic Mode Analysis of Inhomogeneous Optical Waveguides (Present Work)	48
3.2.1	TE solutions	50
3.2.2	TM solutions	54
3.2.3	Radiation Confinement Factor (TE/TM degeneracy)	60
3.3	Results and Discussion	60
3.3.1	TE Case	60
3.3.2	TM Case	62
3.3.3	Group Delay and Radiation Confinement Factor for TE/TM Modes	64
3.4	Summary and Conclusions	65
	References	69
	Tables (3.1 - 3.10)	70 - 79
	Figures (3.1 - 3.15)	

CHAPTER No.	TITLE	PAGE No.
4	A STUDY OF NONLINEAR SURFACE WAVES AND GUIDED WAVES IN PLANAR OPTICAL WAVEGUIDE	80 - 106
4.1	Introduction	80
4.2	Revisiting Tomlinson's Analysis (Present Work)	82
4.2.1	Field Parameters	83
4.2.2	Critical Power of the Surface Wave	87
4.2.3	Results and Discussion	93
4.3	Nonlinear Propagation of TE Waves in high-index Guiding layer :(Present Work)	96
4.3.1	Intensity Effect on Field variation	97
4.3.2	Results and Discussion	99
4.4	Nonlinear Propagation of TE Waves in low-index Guiding layer : (Present Work)	99
4.4.1	Results and Discussion	101
4.5	Summary and Conclusions	102
	References	105
	Table	106
	Figures (4.1 - 4.5)	