

Contents

Preface	xi
0 An introduction to the Texas Instruments BA II Plus	1
0.1 Choosing a calculator	1
0.2 Font convention	2
0.3 BA II Plus basics	2
0.4 Problems, Chapter 0	7
1 The growth of money	9
1.1 Introduction	9
1.2 What is interest ?	10
1.3 Accumulation and amount functions	11
1.4 Simple interest / Linear accumulation functions	15
1.5 Compound interest (The usual case!)	20
1.6 Interest in advance / The effective discount rate	25
1.7 Discount functions / The time value of money	29
1.8 Simple discount	39
1.9 Compound discount	41
1.10 Nominal rates of interest and discount	46
1.11 A friendly competition (Constant force of interest)	54
1.12 Force of interest	57
1.13 Note for those who skipped Sections (1.11) and (1.12)	60
1.14 Inflation	61
1.15 Problems, Chapter 1	64
2 Equations of value and yield rates	76
2.1 Introduction	76
2.2 Equations of value for investments involving a single deposit made under compound interest	77
2.3 Equations of value for investments with multiple contributions	79
2.4 Investment return	87
2.5 Reinvestment considerations	94
2.6 Approximate dollar-weighted yield rates	95
2.7 Fund performance	100
2.8 Problems, Chapter 2	103

viii Contents

3	Annuities (annuities certain)	112
3.1	Introduction	112
3.2	Annuities - immediate	114
3.3	Annuities - due	128
3.4	Perpetuities	131
3.5	Deferred annuities and values on any date	133
3.6	Outstanding loan balances	138
3.7	Nonlevel annuities	144
3.8	Annuities with payments in geometric progression	146
3.9	Annuities with payments in arithmetic progression	149
3.10	Yield rate examples involving annuities	156
3.11	Annuity symbols for nonintegral terms	161
3.12	Annuities governed by general accumulation functions	164
3.13	The investment year method	168
3.14	Problems, Chapter 3	172
4	Annuities with different payment and conversion periods	186
4.1	Introduction	186
4.2	Level annuities with payments less frequent than each interest period	187
4.3	Level annuities with payments more frequent than each interest period	191
4.4	Annuities with payments less frequent than each interest period and payments in arithmetic progression	198
4.5	Annuities with payments more frequent than each interest period and payments in arithmetic progression	201
4.6	Continuously paying annuities	205
4.7	A yield rate example	210
4.8	Problems, Chapter 4	213
5	Loan repayment	220
5.1	Introduction	220
5.2	Amortized loans and amortization schedules	220
5.3	The Sinking Fund method	229
5.4	Loans with other repayment patterns	236
5.5	Yield rate examples and replacement of capital	239
5.6	Problems, Chapter 5	247
6	Bonds	255
6.1	Introduction	255
6.2	Bond alphabet soup and the basic price formula	256
6.3	The premium-discount formula	262
6.4	Other pricing formulas for bonds	264

Contents ix

6.5	Bond amortization schedules	266
6.6	Valuing a bond after its date of issue	276
6.7	Selling a bond after its date of issue	283
6.8	Yield rate examples	292
6.9	Callable bonds	296
6.10	Floating-rate bonds	301
6.11	The BA II Plus calculator Bond worksheet	302
6.12	Problems, Chapter 6	308
7	Stocks and financial markets	316
7.1	Common and preferred stock	316
7.2	Brokerage accounts	320
7.3	Going long: buying stock with borrowed money	326
7.4	Selling short: selling borrowed stocks	329
7.5	Problems, Chapter 7	334
8	Arbitrage, the term structure of interest rates, and derivatives	338
8.1	Introduction	338
8.2	Arbitrage	339
8.3	The term structure of interest rates	342
8.4	Forward contracts	353
8.5	Commodity futures held until delivery	355
8.6	Offsetting positions and liquidity of futures contracts	362
8.7	Price discovery and more kinds of futures	367
8.8	Options	369
8.9	Using replicating portfolios to price options	374
8.10	Using weighted averages to price options	387
8.11	Swaps	394
8.12	Problems, Chapter 8	401
9	Interest rate sensitivity	412
9.1	Overview	412
9.2	Duration	416
9.3	Convexity	430
9.4	Immunization	437
9.5	Other types of duration	445
9.6	Problems, Chapter 9	449

x Contents

APPENDICES

A	Some useful formulas	455
B	Answers to end of chapter problems	461
	Bibliography	485
	Index	487