

Contents

1	The Convergence Analysis of Two Step Fourth Order Methods Under the Same Set of Condition	1
1.	Introduction	1
2.	Local Convergence	2
3.	Semi-local Convergence	5
4.	Extensions and Related Method	8
4.1.	Local Convergence of Method (1.14)	9
4.2.	Semi-local Convergence of Method (1.14)	10
4.3.	Local Convergence of Method (1.15)	11
4.4.	Semi - local Convergence of Method (1.15)	11
4.5.	Local convergence of method (1.16)	12
4.6.	Semi-local Convergence of method (1.16)	12
4.7.	Local Convergence of Method (1.17)	13
4.8.	Semi - local Convergence of Method (1.17)	15
5.	Extensions and Related Method	15
6.	Seventh Order Methods	22
7.	Multistep Extension of Method (1.18)	24
8.	References	26
2	On the Convergence of Four Sixth Order Methods	29
1.	Introduction	29
2.	Local Convergence	30
2.1.	Method (2.1)	30
2.2.	Method (2.2)	32
2.3.	Method(2.3)	34
2.4.	Method (2.4)	35
3.	Semi-local Convergence	36
3.1.	Method (2.1)	36
3.2.	Method (2.2)	38
3.3.	Method (2.3)	39
3.4.	Method (2.4)	40
4.	References	41

3	On the Convergence of Sixteenth Order Method for Solving Equations	45
1.	Introduction	45
2.	Local Convergence	46
3.	Semi-Local Convergence	55
4.	References	61
4	On The Convergence Of Two Competing Eighth Order Methods With Divided Differences And Derivatives	63
1.	Introduction	63
2.	Local convergence	64
3.	Semi-local Convergence	67
4.	References	70
5	Multistep Methods Of High Convergence Order For Solving Equations	73
1.	Introduction	73
2.	Local convergence	74
3.	Semi-local convergence	76
4.	References	78
6	High Convergence Order Methods For Solving Nonlinear Equations	81
1.	Introduction	81
2.	Local convergence	82
3.	Semi-local Convergence	91
4.	References	98
7	Accelerated Convergence Of Newton'S Method In Banach Spaces	101
1.	Introduction	101
2.	Local convergence	102
3.	References	103
8	Extended Iterative Methods For Generalized Equations	105
1.	Introduction	105
2.	Convergence	105
3.	References	108
9	Newton-Chebyshev-Shamanskii-Type Methods	111
1.	Introduction	111
2.	Local convergence	112
3.	Semi-local Convergence	115
4.	References	119

10	Extended Newton's Method For Solving Generalized Equations Under The Majorant Condition	121
1.	Introduction	121
2.	Semi-local convergence	121
3.	Local convergence	124
4.	References	124
11	Extended Newton's Method For Variational Inequalities Under Smale's γ-Conditions	127
1.	Introduction	127
2.	Preliminaries	127
3.	Newton's Method	128
4.	Alpha-Theory	129
5.	References	131
12	Two Similar Methods For Solving Equations	133
1.	Introduction	133
2.	Local Convergence	134
3.	Semi-local Convergence	134
4.	References	135
13	Extended Gauss-Newton Method For Solving Least Squares Problems	137
1.	Introduction	137
2.	Local convergence	138
3.	References	139
14	Extended Convergence For The Three Step Midpoint Method	141
1.	Introduction	141
2.	Local Convergence	142
3.	Semi-local convergence	143
4.	References	144
15	Extended Otrowski-Type Three Step Methods	147
1.	Introduction	147
2.	Local Convergence	148
3.	Semi-local Convergence	150
4.	References	151
16	Secant-Like Methods For Solving Generalized Equations In Banach Space	153
1.	Introduction	153
2.	Background	153
3.	Local Convergence Analysis	155
4.	An Extension	157
5.	References	157

17 Newton's Method For Solving Equations With Constant Rank	
Derivatives I: Local Convergence	159
1. Introduction	159
2. Mathematical Background	160
3. Local Convergence	162
4. References	162
18 Newton's Method For Solving Equations With Constant Rank	
Derivatives II: Semi-Local Convergence	165
1. Introduction	165
2. Mathematical Background	165
3. References	167
19 Extended Convergence Of Newton's Method For Singular Equations Using Outer Inverses:I	169
1. Introduction	169
2. Local Convergence	169
3. References	173
20 Extended Convergence Of Newton's Method For Singular Equations Using Outer Inverses	175
1. Introduction	175
2. Local Convergence	175
3. References	179
21 Extended Convergence Of Newton's Method For Singular Equations Using Outer Inverse:III	181
1. Introduction	181
2. Convergence	182
3. References	185
22 Extended Josephy's Theory For Generalized Equations	187
1. Introduction	187
2. Convergence	187
3. References	189
23 Extended Convergence Region For The Secant Method	191
1. Introduction	191
2. Convergence	191
3. References	194
24 Extended Convergence Domains For Secant-Like Methods With One Parameter	195
1. Introduction	195
2. Local Convergence	196
3. References	198

25	Extended Local Convergence of a Three-Step Traub-Like Methods	199
1.	Introduction	199
2.	Local Convergence	200
3.	References	203
26	On a Traub-Type Three Step Method	205
1.	Semi-local Convergence	205
2.	Majorizing sequence	205
3.	Convergence Analysis	206
4.	References	210
27	Extended Existence Theorems of Kantorovich and Moore from Interval Analysis	213
1.	Introduction	213
2.	Existence Theorems	213
3.	References	219
28	Extended Semi-Local Convergence Analysis of a Sixth Convergence Order Method	221
1.	Introduction	221
2.	Background	221
3.	Recurrence relations	224
4.	Semi-local convergence	224
5.	References	225
29	Extended Convergence Region for a Certain Class of Secant-Type Methods	227
1.	Introduction	227
2.	Semi-local convergence	228
3.	References	230
30	On The Convergence of a Fifth Order Sharma-Guha Method	233
1.	Introduction	233
2.	Local convergence	234
3.	Semi-local convergence	235
4.	References	236
31	Novel Three Order Methods for Solving Equations in Banach Spaces	239
1.	Introduction	239
2.	Local convergence	240
3.	References	245

32 On the Starting Points for Two Step Iterative Methods	247
1. Introduction	247
2. Convergence I: Local	248
3. Convergence II: Semi-local	249
4. References	251
33 Extended Kantorovich Theorem for Generalized Equations	253
1. Introduction	253
2. Local convergence	253
3. Special cases	255
4. References	257
34 Jarratt-Like Sixth Order Methods for Nonlinear Equations	259
1. Introduction	259
2. Convergence 1: Local	260
3. Convergence 2: Semi-local	263
4. References	265
35 A Family of Sixth Order Methods for Solving Equations	267
1. Introduction	267
2. Convergence I: Local	267
3. Convergence II: Semi-local	270
4. References	271
36 On a Multi-Step Iterative Method of Convergence Order $3(p + 1)$ ($p \in \mathbb{N}$)	273
1. Introduction	273
2. Local Convergence	274
3. Semi-local convergence	276
4. References	278
37 Three Step Sixth Order Methods	279
1. Introduction	279
2. Local Convergence	280
3. Semi-local Convergence	284
4. References	287
38 Two Ninth Convergence Order Methods for Nonlinear Equations	289
1. Introduction	289
2. Local Convergence	290
3. Semi-Local Convergence	295
4. References	299

39 A Family of Sixth Order Methods with Parameters	301
1. Introduction	301
2. Local Convergence	302
3. Semi-local Convergence	305
4. References	307
40 On the Convergence of Traub's Method	309
1. Introduction	309
2. Local Convergence	309
3. Semi-local Convergence	311
4. References	312
41 On an Eighth Order Method	313
1. Introduction	313
2. Local Convergence	313
3. Semi-local Convergence	315
4. References	317
42 Semi-Local Convergence for Two Competing Derivative Free Fourth Order Methods	319
1. Introduction	319
2. Convergence	320
3. References	323
43 Two Sixth Convergence Order Methods Under the Same Conditions	325
1. Introduction	325
2. Local convergence	326
3. Semi-local convergence	329
4. References	331
44 On a Multistep Method for Solving Equations	333
1. Introduction	333
2. Local convergence	334
3. Semi-local Convergence	337
4. References	338
45 On Kou's Third Order Method	341
1. Introduction	341
2. Local Convergence	341
3. Semi-local Convergence	342
4. References	344

46 Fifth Order Jarratt Type Method	347
1. Introduction	347
2. Local Convergence	347
3. Semi-local Convergence	349
4. References	350
47 Fourth Order Kung-Traub-Type Method	353
1. Introduction	353
2. Local Convergence	354
3. Semi-local convergence	355
4. References	356
48 Extended Fifth Order Derivative Free Method	359
1. Introduction	359
2. Convergence 1: Local	359
3. Convergence 2: Semi-local	362
4. References	363
49 Feasible Inexact Newton Projections for Constrained Generalized Equations	365
1. Introduction	365
2. Convergence of NIPM	366
3. References	368
50 Newton'S Method with Feasible Inexact Projections for Solving Constrained Generalized Equations	371
1. Introduction	371
2. Notation and auxiliary results	373
3. Proposed method and its local convergence analysis	375
3.1. Proof of Theorem 54	378
4. References	381
51 Extended Local Convergence of Newton's Method for Solving Strong Regular Generalized Equations	383
1. Introduction	383
2. Local convergence	384
3. Special cases	386
4. References	388
52 Inexact Newton-Type Conditional Gradient Method for Systems	391
1. Introduction	391
2. Local convergence	392
3. Special cases	394
4. References	396

53 The Halley Method Under the Majorant Condition	397
1. Introduction	397
2. Convergence	397
3. References	401
54 Parametric Iterative Methods of Order Three and Four	403
1. Introduction	403
2. Local Convergence	404
3. Semi-local Convergence	406
4. Example	407
5. References	407
55 On the Convergence of a Three-Step Eighth Order Jarrat-Type Methods	409
1. Introduction	409
2. Local Convergence	410
3. Semi-local convergence	413
4. References	415
56 Generalized Ostrowski-Chun-like Method	417
1. Introduction	417
2. Local Convergence	417
3. Semi-local convergence	419
4. References	421
57 On an Efficient Sixth Order Method	423
1. Introduction	423
2. Local Convergence	424
3. Semi-Local Convergence	426
4. References	426
58 On a Seventh Order Method with a Divided Difference and a Derivative	429
1. Introduction	429
2. Local Convergence	429
3. Semi-Local Convergence	431
4. References	434
59 Extended Convergence for a Family of Third Order Methods	435
1. Introduction	435
2. Local Convergence	436
3. Semi-local convergence	438
4. Isolation of a solution	440
5. References	442

60 Derivative Free Methods of Order Four and Seven	445
1. Introduction	445
2. References	456