# Brief Content

**Foreword** 

|            | e Book<br>e Authors<br>edgements       | vii<br>ix<br>xi<br>xiii |
|------------|----------------------------------------|-------------------------|
| SECTION    | I                                      | 1                       |
| CHAPTER 1: | Introduction to TQM                    | 3                       |
| CHAPTER 2: | TQM — A Roadmap to Excellence          | 27                      |
| CHAPTER 3: | Quality Gurus                          | 45                      |
| CHAPTER 4: | Cost of Quality                        | 59                      |
| CHAPTER 5: | Quality Leadership                     | 75                      |
| SECTION    | II                                     | 89                      |
| CHAPTER 6: | TQM Implementation                     | 91                      |
| CHAPTER 7: | Creating Quality Culture               | 99                      |
| CHAPTER 8: | Customer Focus & Customer Satisfaction | 117                     |

| CHAPTER 9:  | TQM & Quality Improvement                               | 137 |
|-------------|---------------------------------------------------------|-----|
| CHAPTER 10: | Quality Control and Problem Solving: Tools & Techniques | 153 |
| CHAPTER 11: | Business Process Re-engineering (BPR)                   | 185 |
| CHAPTER 12: | Six Sigma (6 σ)                                         | 199 |
| CHAPTER 13: | Quality Function Deployment (QFD)                       | 219 |
| CHAPTER 14: | Value Engineering and Value Analysis                    | 233 |
| CHAPTER 15: | Total Productive Maintenance                            | 241 |
| Section I   | II                                                      | 253 |
| CHAPTER 16: | Quality Management Systems                              | 255 |
| CHAPTER 17: | Quality System Audit                                    | 279 |
| CHAPTER 18: | Environment Management System and Total Quality Control | 289 |
| CHAPTER 19: | Human Resource Development & Quality Circles            | 299 |
| CHAPTER 20: | Quality Awards                                          | 315 |
| SECTION I   | $\mathbf{V}$                                            | 327 |
| CHAPTER 21: | TQM Case Studies in Indian Industries                   | 329 |
| GLOSSARY    |                                                         | 363 |
| INDEX       |                                                         | 387 |

## Detailed Cor

**Foreword** 

Preface

| About the Book About the Authors Acknowledgements | ix<br>xi<br>xiii |
|---------------------------------------------------|------------------|
| SECTION I                                         | 1                |
| CHAPTER 1: Introduction to TQM                    | 3                |
| Introduction                                      | 4                |
| Quality                                           | 4                |
| Total Quality Management                          | 5                |
| Dimensions of TQM                                 | 5                |
| TQM Infrastructure                                | 6                |
| Approach of TQM                                   | 6                |
| Need for TQM                                      | 6                |
| Genesis of TQM                                    | 8                |
| Concept of TQM                                    | 8                |
| Requirements for Implementing TQM                 | 9                |
| New and Old Quality Culture                       | 9                |
| Competitive Advantage                             | 10               |
| Cost Leadership                                   | 12               |
| Differentiation                                   | 12               |
| Quality as Competitive Advantage                  | 12               |
| Quality and Differentiation Strategies            | 13               |
| Superior Product Design                           | 13               |
| Outstanding Service                               | 14               |

 $\boldsymbol{v}$ 

vii

## xviii Total Quality Management

| High Flexibility and Variety             | 14 |
|------------------------------------------|----|
| Continuous Innovation                    | 14 |
| Time Competitiveness                     | 15 |
| Quality Strategies and Business Results  | 15 |
| Advantage of TQM                         | 16 |
| People Orientation                       | 16 |
| Fundamentals of TQM                      | 17 |
| Putting the Customer First               | 18 |
| Management by Fact                       | 18 |
| PDCA Cycle                               | 18 |
| Focus on Prevention                      | 18 |
| Employees' Involvement                   | 19 |
| TQM Philosophy                           | 19 |
| Summary                                  | 23 |
| Review Questions                         | 24 |
| References                               | 24 |
|                                          |    |
| CHAPTER 2: TQM — A Roadmap to Excellence | 27 |
| Introduction                             | 28 |
| Management of Excellence                 | 28 |
| Corporate Cultural Change                | 29 |
| Excellence through Change                | 29 |
| TQM — Key to Excellence                  | 32 |
| Excellence – The World-class             | 34 |
| World-Class Companies Talk about Quality | 34 |
| Factors of Excellence                    | 35 |
| Quark Media House (India)                | 37 |
| Quark Worldwide                          | 37 |
| Quark in India                           | 37 |
| A Multi Level Approach                   | 38 |
| Quality Objectives                       | 38 |
| TQM Implementation                       | 38 |
| TQM Variables                            | 39 |
| Leadership                               | 40 |
| Strategic Planning                       | 40 |
| Customer Focus                           | 40 |
| Customer Satisfaction                    | 40 |
| Supplier Focus                           | 41 |
|                                          |    |

|                                        | Detailed Contents xix |
|----------------------------------------|-----------------------|
| Human Resource Focus                   | 41                    |
| Human Resource Satisfaction            | 41                    |
| Process Management                     | 41                    |
| Information Management                 | 41                    |
| Impact on Society                      | 42                    |
| Organization Specific Results          | 42                    |
| Summary                                | 42                    |
| Review Questions                       | 43                    |
| References                             | 43                    |
| HAPTER 3: Quality Gurus                | 45                    |
| Introduction                           | 46                    |
| W. Edwards Deming                      | 47                    |
| Joseph M. Juran                        | 48                    |
| Armand V. Feigenbaum                   | 49                    |
| Kaoru Ishikawa                         | 49                    |
| Genichi Taguchi                        | 50                    |
| Shigeo Shingo                          | 50                    |
| Philip B. Crosby                       | 51                    |
| Claus Moller                           | 52                    |
| Tom Peters                             | 53                    |
| Bill Smith                             | 53                    |
| W.G.Ouchi                              | 55                    |
| Vilfredo Pareto                        | 55                    |
| S.R. Udpa                              | 55                    |
| Stephen Covey                          | 56                    |
| J.S. Oakland                           | 56                    |
| Summary                                | 57                    |
| Review Questions                       | 57                    |
| References                             | 58                    |
| HAPTER 4: Cost of Quality              | 59                    |
| Introduction                           | 60                    |
| Concept of Cost of Quality             | 60                    |
| Benefits of Quality Costing            | 61                    |
| Classification of the Costs of Quality | 61                    |
| Cost of Conformance (COC)              | 61                    |
| Cost of Non-conformance (CONC)         | 62                    |

| Basic Operational Costs (BOC)                           | 62  |
|---------------------------------------------------------|-----|
| Cost of Lost Opportunities                              | 62  |
| Appraisal Costs                                         | 63  |
| Prevention Costs                                        | 63  |
| Failure Costs                                           | 66  |
| Checking, Inspecting and Evaluating Costs               | 67  |
| Reducing Cost by Quality Improvement Activites          | 68  |
| Hidden Costs                                            | 68  |
| Calculating Cost of Quality                             | 69  |
| Calculating/Measuring Cost of Quality                   | 70  |
| Problems in Calculating Cost of Quality                 | 70  |
| Cost of Quality: Key Ratios                             | 71  |
| Uses of Quality Ratios                                  | 72  |
| Steps for Cost of Quality Study                         | 72  |
| Summary                                                 | 73  |
| Review Questions                                        | 73  |
| References                                              | 74  |
| CHAPTER 5: Quality Leadership                           | 75  |
| Introduction                                            | 76  |
| Attributes of Quality Leaders                           | 78  |
| Role of TQM Leaders                                     | 79  |
| Deming's 14 Points for Top Management                   | 80  |
| Create and Publish Purpose & Aims for Improvement       | 80  |
| Learn the New Philosophy                                | 80  |
| Avoid Dependence on Mass Inspection                     | 80  |
| Stop Practice of Awarding Business on Price Tag Alone   | 80  |
| Improve System Constantly                               | 81  |
| Institute Training                                      | 81  |
| Teach and Institute Leadership                          | 81  |
| Drive out Fear: Create Trust and Climate for Innovation | 81  |
| Break Barriers between Staff Areas                      | 81  |
| Eliminate, Exhortations for Work Force                  | 81  |
| (a) Eliminate Numerical Quota for Work Force            | 81  |
| (b) Eliminate Numerical Goals for People in Management  | 82  |
| Remove Barriers that Rob People of Pride of Workmanship | 82  |
| Encourage Education and Self-improvement for Every One  | 82  |
| Take Astign to Assemblish the Transformation            | 2.0 |
| Take Action to Accomplish the Transformation            | 82  |

|                                                                                                                                                                                                                                                                                                                  | Detailed Contents |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
|                                                                                                                                                                                                                                                                                                                  |                   |
| Strategies for Top Management                                                                                                                                                                                                                                                                                    |                   |
| Proactive Management                                                                                                                                                                                                                                                                                             |                   |
| Bold Change Management                                                                                                                                                                                                                                                                                           |                   |
| Do it Right First Time Continuous Preventive Action                                                                                                                                                                                                                                                              |                   |
|                                                                                                                                                                                                                                                                                                                  |                   |
| Care for Little Things and Accumulate Gains Ensure Economic Performance                                                                                                                                                                                                                                          |                   |
| Practice Management By Walking Around (MBWA)                                                                                                                                                                                                                                                                     |                   |
| Measure Success                                                                                                                                                                                                                                                                                                  |                   |
| Never Rest on Past Laurels, Continue to Improve                                                                                                                                                                                                                                                                  |                   |
| Build a virtual Organization                                                                                                                                                                                                                                                                                     |                   |
| Summary                                                                                                                                                                                                                                                                                                          |                   |
| Review Questions                                                                                                                                                                                                                                                                                                 |                   |
| References                                                                                                                                                                                                                                                                                                       |                   |
| APTER 6: TQM Implementation                                                                                                                                                                                                                                                                                      |                   |
| Introduction                                                                                                                                                                                                                                                                                                     |                   |
| TQM Implementation: PDSA                                                                                                                                                                                                                                                                                         |                   |
|                                                                                                                                                                                                                                                                                                                  |                   |
|                                                                                                                                                                                                                                                                                                                  |                   |
| Planning Phase                                                                                                                                                                                                                                                                                                   |                   |
| Planning Phase Quality Council (QC)                                                                                                                                                                                                                                                                              |                   |
| Planning Phase Quality Council (QC) TQM Facilitator                                                                                                                                                                                                                                                              |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members                                                                                                                                                                                                                     |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan                                                                                                                                                                                              |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan Strategies for TQM Implementation                                                                                                                                                            |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan Strategies for TQM Implementation Process for Improvement                                                                                                                                    |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan Strategies for TQM Implementation Process for Improvement PDSA and Continuous Improvement                                                                                                    |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan Strategies for TQM Implementation Process for Improvement PDSA and Continuous Improvement TQM Implementation Barriers                                                                        |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan Strategies for TQM Implementation Process for Improvement PDSA and Continuous Improvement TQM Implementation Barriers Summary                                                                |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan Strategies for TQM Implementation Process for Improvement PDSA and Continuous Improvement                                                                                                    |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan Strategies for TQM Implementation Process for Improvement PDSA and Continuous Improvement TQM Implementation Barriers Summary Review Questions References                                    |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan Strategies for TQM Implementation Process for Improvement PDSA and Continuous Improvement TQM Implementation Barriers Summary Review Questions                                               |                   |
| Planning Phase Quality Council (QC) TQM Facilitator Roles and Responsibilities of QC Members Strategic Quality Plan Strategies for TQM Implementation Process for Improvement PDSA and Continuous Improvement TQM Implementation Barriers Summary Review Questions References  APTER 7: Creating Quality Culture |                   |

### xxii Total Quality Management

| Role Modeling                                                  | 102 |
|----------------------------------------------------------------|-----|
| Organizational Values                                          | 102 |
| Creating TQM Culture                                           | 103 |
| Quality Maturity                                               | 105 |
| Level Zero                                                     | 105 |
| Level One                                                      | 106 |
| Level Two                                                      | 106 |
| Level Three                                                    | 106 |
| Level Four                                                     | 106 |
| Level Five                                                     | 107 |
| Level Six                                                      | 107 |
| Resistance to Change                                           | 107 |
| 4~soft Ss'                                                     | 108 |
| Types of Culture                                               | 109 |
| Power Culture                                                  | 109 |
| Role Culture                                                   | 110 |
| Task Culture                                                   | 110 |
| Person Culture                                                 | 110 |
| Breaking Through Cultural Wall                                 | 112 |
| Steps for Creating TQM Culture                                 | 114 |
| Management's Actions in Delighting Customer                    | 114 |
| Dismantling Boundaries and Internal Competition                | 114 |
| Fact-based Decision Making                                     | 114 |
| Kaizen                                                         | 114 |
| No Organizational Structures of TQM                            | 115 |
| Summary                                                        | 115 |
| Review Questions                                               | 116 |
| References                                                     | 116 |
| Cyr. roman 9. Cyr. town on Flagues & Cyr. town on Satisfaction | 117 |
| CHAPTER 8: Customer Focus & Customer Satisfaction              | 117 |
| Introduction                                                   | 118 |
| Customer Focus                                                 | 118 |
| Customer Quality                                               | 120 |
| Customer Feedback                                              | 120 |
| Purpose of Feedback                                            | 121 |
| Service Industry And Quality                                   | 121 |
| Value In Service Industry                                      | 122 |
| Buyer-supplier Relationship                                    | 122 |
|                                                                |     |

|                                            | Detailed Contents | ххііі |
|--------------------------------------------|-------------------|-------|
|                                            |                   |       |
| Customer Satisfaction                      |                   | 123   |
| Definition                                 |                   | 124   |
| Features                                   |                   | 124   |
| Customer Orientation                       |                   | 126   |
| Customer Attrition                         |                   | 127   |
| Delighting Customer                        |                   | 127   |
| Customer Contact                           |                   | 127   |
| Kano Model                                 |                   | 128   |
| Customer Requirements                      |                   | 130   |
| Perceived Quality                          |                   | 130   |
| Communication Gap                          |                   | 131   |
| Review                                     |                   | 131   |
| Documented Policy                          |                   | 131   |
| Measuring Customer Satisfaction            |                   | 131   |
| Identify Measures                          |                   | 132   |
| Perceived Quality                          |                   | 132   |
| Documentation P. I                         |                   | 132   |
| Delivery Error                             |                   | 132   |
| Execution Delay                            |                   | 133   |
| Summary                                    |                   | 133   |
| Review Questions                           |                   | 134   |
| References                                 |                   | 135   |
| CHAPTER 9: TQM & Quality Improvement       |                   | 137   |
| Introduction                               |                   | 138   |
| Just~in Time Manufacture                   |                   | 138   |
| Kanban                                     |                   | 139   |
| Zero Defect Concept                        |                   | 140   |
| Benchmarking                               |                   | 141   |
| Terotechnology                             |                   | 142   |
| Organizational Functions in Terotechnology |                   | 143   |
| Life Cycle Costs                           |                   | 144   |
| Design of Experiments                      |                   | 146   |
| Cuncurrent Engineering and Quality Control |                   | 146   |
| Tools and Techinques                       |                   | 148   |
| Gains from Concurrent Engineering          |                   | 149   |
| CAD/CAM in Quality Control                 |                   | 149   |
| Computer-Aided Design (CAD)                |                   | 149   |
|                                            |                   |       |

### xxiv Total Quality Management

|    | Computer Aided Manufacturing (CAM)                                 | 150 |
|----|--------------------------------------------------------------------|-----|
|    | Summary                                                            | 150 |
|    | Review Questions                                                   | 151 |
|    | References                                                         | 151 |
| Cı | HAPTER 10: Quality Control and Problem Solving: Tools & Techniques | 153 |
|    | Introduction                                                       | 154 |
|    | Problem Solving                                                    | 155 |
|    | Tools and Techniques                                               | 156 |
|    | Check Sheet                                                        | 157 |
|    | Tree Diagram                                                       | 158 |
|    | Pareto Chart                                                       | 158 |
|    | Fishbone Diagram/Cause and Effect Diagram                          | 159 |
|    | Control Charts                                                     | 161 |
|    | Statistical Process Control (SPC)                                  | 161 |
|    | Type of Control Charts                                             | 163 |
|    | Uses of Control Charts                                             | 163 |
|    | Histograms                                                         | 163 |
|    | Steps for Drafting a Histogram                                     | 164 |
|    | Type of Histograms                                                 | 165 |
|    | Limitations of Histograms                                          | 168 |
|    | Scatter Diagram                                                    | 168 |
|    | Run Charts/Trend Charts                                            | 170 |
|    | Brainstorming                                                      | 171 |
|    | Criticism is Prohibited                                            | 171 |
|    | Generate Ideas Freely                                              | 171 |
|    | Build upon Ideas of Others                                         | 171 |
|    | Affinity Diagram                                                   | 172 |
|    | Benchmarking                                                       | 173 |
|    | Internal Benchmarking                                              | 173 |
|    | Competitive Benchmarking                                           | 174 |
|    | Process Benchmarking                                               | 175 |
|    | Strategic Benchmarking                                             | 175 |
|    | Flow Chart                                                         | 176 |
|    | Line Graph                                                         | 176 |
|    | Failure Mode and Effect Analysis                                   | 177 |
|    | Quality Function Deployment                                        | 180 |
|    | Force Field Analysis                                               | 181 |
|    |                                                                    |     |

|                                                      | Detailed Contents XXV |
|------------------------------------------------------|-----------------------|
| Seven 'W' and Is/Is-not Questions                    | 181                   |
| Summary                                              | 183                   |
| Review Questions                                     | 183                   |
| References                                           | 184                   |
| CHAPTER 11: Business Process Re-engineering (BPR)    | 185                   |
| Introduction                                         | 186                   |
| BPR Concept                                          | 187                   |
| Goals Driving BPR                                    | 188                   |
| Evolution of BPR                                     | 188                   |
| BPR Initiatives                                      | 189                   |
| BPR & ERP – Successes and Failures                   | 189                   |
| BPR Myths                                            | 191                   |
| Difference between TQM & BPR                         | 193                   |
| Advantages of BPR                                    | 193                   |
| Limitations of BPR                                   | 194                   |
| Future of BPR                                        | 194                   |
| Case Study                                           | 195                   |
| Summary                                              | 197                   |
| Review Questions                                     | 198                   |
| References                                           | 198                   |
| Chapter 12: Six Sigma (6 σ)                          | 199                   |
| Introduction                                         | 200                   |
| Practical Impact of Process Capability of Quality    | 201                   |
| Evolution of Six Sigma                               | 202                   |
| Phases of Six Sigma                                  | 205                   |
| Case Studies                                         | 206                   |
| Wipro                                                | 206                   |
| Six Sigma at WIPRO                                   | 206                   |
| DSSS (Development of Six Sigma Software) Methodology | 208                   |
| Satyam                                               | 208                   |
| Organization                                         | 208                   |
| Vision                                               | 209                   |
| Six Sigma model for Business Support Processes       | 210                   |
| Phases of Six Sigma Business Process Model           | 211                   |
| Six Sigma Problems                                   | 211                   |
| Deployment Process                                   | 212                   |

| xxvi | Total | Quality | Management |
|------|-------|---------|------------|
|------|-------|---------|------------|

| A Balanced Perspective of Six Sigma at SATYAM Envisages | 212               |
|---------------------------------------------------------|-------------------|
| Action Points for Going Forward                         | 213               |
| TATA Consultancy Services (TCS)                         | 213               |
| TQM – The Six Sigma Way                                 | 213               |
| Key Learnings                                           | 214               |
| Summary                                                 | 217               |
| Review Questions                                        | 217               |
| References                                              | 217               |
| CHAPTER 13: Quality Function Deployment (QFD)           | 219               |
| Introduction                                            | 220               |
| QFD Application: An Overview                            | 221               |
| House of Quality                                        | 223               |
| Building House of Quality                               | 224               |
| QFD-Concept                                             | 225               |
| Matrix Based Methodology                                | 225               |
| Merits of QFD                                           | 228               |
| Demerits of QFD                                         | 228               |
| Advantages of QFD                                       | 229               |
| Summary                                                 | 231               |
| Review Questions                                        | 231               |
| References                                              | 232               |
| CHAPTER 14: Value Engineering and Value Analysis        | 233               |
| Introduction                                            | 234               |
| Value Addition                                          | 234               |
| Quality Measurement System                              | 236               |
| Benchmarking                                            | 236               |
| Value Engineering                                       | 236               |
| Conditions for Success                                  | 237               |
| Phases of Study                                         | 237               |
| Tests of Value                                          |                   |
| Applications                                            | 237               |
|                                                         | 237<br>238        |
| Summary                                                 | 238<br>238        |
| Summary<br>Review Questions                             | 238<br>238<br>239 |
| •                                                       | 238<br>238        |

| D - 1 - 1 |    | 0-  |      |     |
|-----------|----|-----|------|-----|
| Detail    | ea | COL | iter | ITS |

xxvii

| CHAPTER 15: Total Productive Maintenance  | 241 |
|-------------------------------------------|-----|
| Introduction                              | 242 |
| TPM-Latest Management 'Mantra'            | 242 |
| Origin of TPM                             | 243 |
| Objectives of TPM                         | 243 |
| Predicitive Maintenance                   | 244 |
| Total Preventive Maintenace               | 244 |
| Overall Equipment Efficiency (OEE)        | 244 |
| MTBF                                      | 244 |
| MTTR                                      | 244 |
| Pillers of TQM                            | 245 |
| Pillar 1-5Ss                              | 245 |
| Piller 2- JHAM                            | 245 |
| Piller 3- Kobestu Kaizen (KK)             | 245 |
| Pillar 4 – Planned Maintenance (PM)       | 246 |
| Pillar 5 – Quality Maintenance (QM)       | 246 |
| Pillar 6 – Training                       | 246 |
| Pillar 7 – Office TPM                     | 246 |
| Pillar 8 – Safety Health and Environment  | 247 |
| Poka~Yoke                                 | 247 |
| Terotechnology                            | 247 |
| Implementing TPM for Zero Breakdown       | 248 |
| TPM Implementation Guidelines             | 248 |
| Summary                                   | 250 |
| Review Questions                          | 250 |
| References                                | 251 |
| SECTION III                               | 253 |
| CHAPTER 16: Quality Management Systems    | 255 |
| Introduction                              | 256 |
| Quality Management Principles             | 257 |
| Principle 1-Customer Focus                | 257 |
| Principle 2-Leadership                    | 257 |
| Principle 3-People Involvement            | 257 |
| Principle 4-Process Approach              | 257 |
| Principle 5-System Approach to Management | 258 |
| Principle 6-Continuous Improvement        | 258 |

### xxviii Total Quality Management

| Principle 7-Decision Making                     | 258 |
|-------------------------------------------------|-----|
| Principle 8-Suppliers Relationship              | 258 |
| Evolution of QS                                 | 258 |
| Purposes of QMS                                 | 259 |
| ISO                                             | 260 |
| Elements of ISO 9000                            | 262 |
| Benefits of ISO 9000 Standards                  | 264 |
| Observed Benefits                               | 265 |
| Activity & Scope                                | 267 |
| Quality Systems Documentation                   | 268 |
| Quality Manual                                  | 269 |
| Quality Procedures                              | 269 |
| Work Instructions                               | 269 |
| Forms and Records                               | 270 |
| Documents Approval                              | 270 |
| Documentation Benefits                          | 270 |
| QS 9000 Initiatives in India                    | 271 |
| Need for QS 9000                                | 271 |
| Structure of QS 9000                            | 271 |
| Requirements of QS 9000 in Addition to ISO 9001 | 273 |
| ISO 9000 in India                               | 273 |
| ISO 9000 Implementation – Worldwide             | 274 |
| Limitations of ISO 9000                         | 276 |
| Summary                                         | 277 |
| Review Questions                                | 278 |
| References                                      | 278 |
| CHAPTER 17: Quality System Audit                | 279 |
| Introduction                                    | 280 |
| Use of Quality Audit                            | 280 |
| Features of Quality Audit                       | 281 |
| Purpose of Quality Audit                        | 281 |
| Catagories of Quality Audit                     | 282 |
| First Party Audit                               | 282 |
| Second Party                                    | 282 |
| Third Party Audit                               | 283 |
| System Audit                                    | 283 |
| Process Audit                                   | 283 |
|                                                 |     |

|                                                             | D. 11 10            |     |
|-------------------------------------------------------------|---------------------|-----|
|                                                             | Detailed Contents X | xix |
| Product Audit                                               | 28                  | 3   |
| Adequacy Audit                                              | 28                  |     |
| Compliance Audit                                            | 28-                 | 4   |
| Quality Audit Planning                                      | 28-                 | 4   |
| Human Relationship in Auditing                              | 28                  | 5   |
| Ingredients of a Quality Audit                              | 28                  | 5   |
| Common Non-conformities                                     | 280                 | 6   |
| Summary                                                     | 28'                 | 7   |
| Review Questions                                            | 28'                 | 7   |
| References                                                  | 28                  | 7   |
| CHAPTER 18: Environment Management System and Total Quality | y Control 289       | 9   |
| Introduction                                                | 290                 | 0   |
| International Standards on EMS                              | 29                  | 1   |
| Action Point for EMS                                        | 29                  | 2   |
| Systems Approach to Environment Management                  | 298                 | 3   |
| System Requirements                                         | 294                 | 4   |
| EMS Audit                                                   | 29                  | 5   |
| Benefits of EMS Certification                               | 29                  | 6   |
| Integrating with ISO 9000                                   | 290                 | 6   |
| Summary                                                     | 290                 | 6   |
| Review Questions                                            | 29'                 | 7   |
| References                                                  | 29                  | 7   |
| CHAPTER 19: Human Resource Development & Quality Circles    | 299                 | 9   |
| Introduction                                                | 300                 | 0   |
| Human Resources Development                                 | 300                 | 0   |
| Top Management and Senior Management                        | 30                  | 1   |
| Middle Management                                           | 30                  | 1   |
| Production Supervisors                                      | 30                  | 1   |
| Workers                                                     | 30                  | 1   |
| Quality Circles                                             | 30                  | 1   |
| Advantages of Quality Circles                               | 302                 | 2   |
| Introducing Quality circle Programme in An Organization     | 30                  | 3   |
| Evaluation of Feasibility                                   | 30                  | 3   |
| Awareness Pogrammes                                         | 30                  |     |
| Planning and Organization                                   | 30-                 |     |
| Orientation of Facilitators and Leaders                     | 304                 | 4   |

### xxx Total Quality Management

| Monitoring and Review of Activities                                                                                                                                                                                                                                                                                  | 304                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Areas of Interest to Quality Circles                                                                                                                                                                                                                                                                                 | 305                                                                              |
| Gains of Quality Circles to Organizations                                                                                                                                                                                                                                                                            | 306                                                                              |
| Quality of Work Life (QWL)                                                                                                                                                                                                                                                                                           | 306                                                                              |
| Quality Circles in India                                                                                                                                                                                                                                                                                             | 308                                                                              |
| Quality Circles Forum for India (QCFI)                                                                                                                                                                                                                                                                               | 308                                                                              |
| Unique Features of Quality Circle                                                                                                                                                                                                                                                                                    | 309                                                                              |
| Basic Idea Underlying Quality Circles                                                                                                                                                                                                                                                                                | 310                                                                              |
| Misconceptions                                                                                                                                                                                                                                                                                                       | 310                                                                              |
| Difference between Quality Circles and Quality Teams                                                                                                                                                                                                                                                                 | 310                                                                              |
| Problem Solving Tools for QCS                                                                                                                                                                                                                                                                                        | 311                                                                              |
| Improvement Plan Through QCS                                                                                                                                                                                                                                                                                         | 312                                                                              |
| Experiences of Implementing QCs Concept                                                                                                                                                                                                                                                                              | 312                                                                              |
| Experiences of Japan                                                                                                                                                                                                                                                                                                 | 312                                                                              |
| Experiences of Other Nations                                                                                                                                                                                                                                                                                         | 313                                                                              |
| Indian Experiences                                                                                                                                                                                                                                                                                                   | 313                                                                              |
| Summary                                                                                                                                                                                                                                                                                                              | 313                                                                              |
| Review Questions                                                                                                                                                                                                                                                                                                     | 314                                                                              |
| P - C                                                                                                                                                                                                                                                                                                                | 314                                                                              |
| References                                                                                                                                                                                                                                                                                                           | 314                                                                              |
|                                                                                                                                                                                                                                                                                                                      |                                                                                  |
| CHAPTER 20: Quality Awards                                                                                                                                                                                                                                                                                           | 315                                                                              |
|                                                                                                                                                                                                                                                                                                                      |                                                                                  |
| CHAPTER 20: Quality Awards                                                                                                                                                                                                                                                                                           | 315                                                                              |
| CHAPTER 20: Quality Awards Introduction                                                                                                                                                                                                                                                                              | <b>315</b> 316                                                                   |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards                                                                                                                                                                                                 | 315<br>316<br>316                                                                |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards                                                                                                                                                                                                                                  | 315<br>316<br>316<br>316                                                         |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards                                                                                                                                                                                                 | 315<br>316<br>316<br>316<br>316                                                  |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards Other Awards Malcolm Baldrige National Quality Award Goals                                                                                                                                      | 315<br>316<br>316<br>316<br>318<br>318<br>318                                    |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards Other Awards Malcolm Baldrige National Quality Award                                                                                                                                            | 315<br>316<br>316<br>316<br>316<br>318<br>318                                    |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards Other Awards Malcolm Baldrige National Quality Award Goals                                                                                                                                      | 315<br>316<br>316<br>316<br>318<br>318<br>318                                    |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards Other Awards Malcolm Baldrige National Quality Award Goals Criteria Deming Prize European Quality Award (EQA)                                                                                   | 315<br>316<br>316<br>316<br>318<br>318<br>318<br>319<br>320<br>321               |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards Other Awards Malcolm Baldrige National Quality Award Goals Criteria Deming Prize European Quality Award (EQA) Golden Peacock National Quality Award                                             | 315 316 316 316 318 318 318 319 320 321 322                                      |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards Other Awards Malcolm Baldrige National Quality Award Goals Criteria Deming Prize European Quality Award (EQA) Golden Peacock National Quality Award Rajiv Gandhi National Quality Award         | 315 316 316 316 318 318 318 319 320 321 322 323                                  |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards Other Awards Malcolm Baldrige National Quality Award Goals Criteria Deming Prize European Quality Award (EQA) Golden Peacock National Quality Award Rajiv Gandhi National Quality Award Summary | 315<br>316<br>316<br>316<br>318<br>318<br>319<br>320<br>321<br>322<br>323<br>324 |
| CHAPTER 20: Quality Awards  Introduction National Awards Community And State Awards Industry Specific Quality Awards Other Awards Malcolm Baldrige National Quality Award Goals Criteria Deming Prize European Quality Award (EQA) Golden Peacock National Quality Award Rajiv Gandhi National Quality Award         | 315 316 316 316 318 318 318 319 320 321 322 323                                  |

|    | X | ٧ | I | ١ | 7 |
|----|---|---|---|---|---|
| ₽. | Ŧ | ď | v | i | ۹ |

| SECTION IV                                                         | 327 |
|--------------------------------------------------------------------|-----|
| CHAPTER 21: TQM Case Studies in Indian Industries                  | 329 |
| Total Quality Service (TQS) in Indian Banks                        | 330 |
| Recommendations                                                    | 331 |
| Quality Function Deployment (QFD) at Bharat Electronics Ltd. (BEL) | 333 |
| Processes of QFD                                                   | 333 |
| Tools of QFD                                                       | 333 |
| Introduction of TQM (TORQUE)                                       | 334 |
| Journey through TQM (TORQUE) Involving QFD                         | 334 |
| Quality Function Deployment (QFD)                                  | 334 |
| QFD Benefits to BEL                                                | 335 |
| Total Quality Service (TQS) at Verka                               | 336 |
| TQM Model at Milkfed                                               | 336 |
| HCL Infosystems                                                    | 339 |
| TATA Infotech                                                      | 342 |
| Chandigarh Infotech Centre                                         | 344 |
| DCM Technologies                                                   | 346 |
| Xerox Modicorp                                                     | 348 |
| Second Foundation (India)                                          | 350 |
| Keane (India)                                                      | 352 |
| Net Programs (India)                                               | 354 |
| Techspan                                                           | 356 |
| Impact of TQM Implementation on Corporate Performance              | 358 |
| GLOSSARY                                                           | 363 |
| Index                                                              | 387 |