CONTENTS

SECTION I: Orthoses

1. Orthosis: The Introduction 3

- *Definition 3*
- *Objective and Function of Orthosis 4*
- *History of Orthosis 4*
- *Prosthetics and Orthotics in India 5*
- *Classification of Orthosis 5*
- *Nomenclature 6*
- *Material Used in Construction of Orthosis 7*
- *Complications of Orthosis 10*
- *Features of Good Orthosis 11*
- *Process of Orthotic Management 12*
- *Role of Physiotherapist in Orthotic and Prosthetic Management 13*

2. Biomechanical Basis of Orthosis 16

- *Biomaterial 16*
- *Strength of Material 17*
- *Mechanical Behavior of Viscoelastic Material 17*
- *Response of Biomaterial to Mechanical Stress 19*
- *Mechanical Behavior of Soft Tissue during Injury 21*
- *How does the Orthosis Work? 22*

3. Wrist and Hand Splints 25

- *Components of Hand Splints 25*
- *Type of Hand Splints 26*
- *Immobilization Splints 27*
- *Mobilization Splints 35*
- *Restoration of MP Extension 40*
- *Restoration of Thumb Movements 43*
- *Splints for Deformity Correction 44*
- *Functional Splints or Prehension Orthoses 50*
- *Static Prehension Orthoses 50*
- *Dynamic Prehension Orthosis 52*
- *Passive Prehension Orthosis 53*
- *Splints for Special Purposes 54*
- *Splinting in Spastic Hand 64*
- *Principle of Prescription of Hand Splint 65*

4. Shoulder and Elbow Orthoses 69
- *Shoulder Orthoses 69*
- *Elbow Orthoses 74*

5. Spinal Orthoses 82
- *Classification of the Spinal Orthosis 82*
- *Cervical Orthoses 83*
- *Prescription of Cervical Orthosis 89*
- *Thoracolumbar Orthosis: Trunk Orthosis 89*
- *Prescription of Trunk Orthosis 100*
- *Orthoses for Spinal Deformities 101*
- *Orthotic Management of Idiopathic Scoliosis 105*
- *Wearing Schedule 105*
- *Orthotic Treatment of Kyphosis 106*

6. Foot Orthoses 108
- *Functions of Foot Orthoses 108*
- *Footwears 108*
- *Construction of Shoe 109*
- *Parts of the Shoe 110*
- *Sole 111*
- *Heel 111*
- *Lining and Reinforcement 112*
- *Upper Designs 113*
- *Shoe Modifications 115*
- *Common Shoe Modifications 115*
- *Modification of Upper 115*
- *Modification of Heel 116*

7. Ankle Foot Orthoses 129
- *Classification of AFO 129*
- *AFO Metal Design 130*
- *AFO Plastic Design 133*
- *Common Plastic AFO Designs 134*
- *Factors Influencing the Biomechanical Function of AFO 140*
- *Evaluating the Functional Characteristics of Plastic AFO 141*
- *Checkout of AFO 143*

8. Knee Ankle Foot Orthoses 145
- *Knee Ankle Foot Orthoses 145*
- *KAFO Standard Design 145*
- *Knee Lock 147*
- *KAFO Scott-Craig Design 148*
- *Swedish Knee Cage 149*
- *Supracondylar KAFO 149*

- *Patella Tendon Bearing Orthosis 150*
- *Knee Gaiters 152*
- *Sports Knee Orthosis 152*
- *Biomechanical Principles Applied to the Design and Fitting of all KAFO 153*

9. Hip Knee Ankle Foot Orthoses 155
- *Conventional HKAFO 155*
- *HKAFO with Trunk Support Attachment 156*
- *Ischial Weight Bearing Orthosis 159*

10. Hip Orthoses 162
- *Orthotic Management of Congenital Dislocation of Hip Joint 62*
- *Pavlik Harness 162*
- *Ilfeld Splint 163*
- *Von Rosen Splint 164*
- *Frejka Pillow 164*
- *The Orthotic Management of Legg-Calvé-Perthes Disease 164*
- *Toronto Orthosis 165*
- *Newington Orthosis 165*
- *Trilateral Socket Hip Abduction Orthosis 166*
- *Scottish–Rite Orthosis 166*
- *Dennis Brown Splint 167*
- *Torsional Shaft Orthosis 167*

SECTION II: Assistive Devices

11. Aids to Bipedal Locomotion 171
- *Cane/stick 171*
- *Crutches 173*
- *Walker 176*

12. Positioning Devices 180
- *Prone Lying 180*
- *Side Lying 181*
- *Sitting 181*
- *Cushions 187*
- *Standing 188*

13. Wheeled Mobility 191
- *Parts of Wheelchair 191*
- *Seat 192*
- *Backrest 192*
- *Armrest 193*

- *Footrest 193*
- *Wheels 194*
- *Brakes and Locks for Wheel 194*
- *Hand Rim 195*
- *Axle 195*
- *Accessories 195*
- *Types of Wheelchair 195*
- *Prescription and Checkout of Wheelchair 198*

SECTION III: Prostheses

14. Lower Limb Prosthesis 203

- *Potential of Various Level of Amputation 204*
- *Construction of Lower Limb Prosthesis 205*
- *Foot Ankle Assembly or Artificial Feet 206*
- *Prosthetic Socket 211*
- *Prosthetic Knee Joint 213*
- *Prosthetic Hip Joint 214*
- *Prosthesis for Various Levels of Lower Limb Amputation 214*
- *Hemipelvectomy and Hip Disarticulation Amputation 224*
- *Research on the Effect of Different Prosthetic Components 226*
- *Role of Physiotherapist in Lower Limb Amputation 227*

15. Upper Limb Prosthesis 229

- *Types of Upper Limb Prostheses System 230*
- *Components of Conventional Body Powered Prosthesis System 232*
- *Prosthesis for Various Levels of Upper Limb Amputation 235*
- *Wrist Disarticulation 236*
- *Below Elbow or Transradial Amputation 236*
- *Above Elbow Amputation 238*
- *Shoulder Disarticulation and Forequarter Amputation 239*
- *The Responsibility of Physiotherapist in the Management of Upper Limb Amputation 241*

Index 243