# Contents

**1. General Configuration and Gross Measurements of Eye** **1**
- Eyeball 1
- Summary of general measurements of eyeball 4

**2. Measurements of Conjunctiva** **6**
- Structure 6
- Portions of conjunctiva 7
- Conjunctival sac 8
- Attachments of bulbar conjunctiva 9
- Fornix-based conjunctival flap 9
- Goblet cells 10
- Conjunctival impression cytology 11
- Summary of measurements and dimensions of conjunctiva 12

**3. Measurements of Sclera** **14**
- Scleral dimensions 14
- Structure of sclera 15
- Insertion of extraocular muscles 16
- Scleral apertures 16
- Weak areas of sclera 20
- Scleral rigidity 20
- Ocular rigidity and applanation tonometry 24
- Functions of sclera 24
- Summary of measurements of sclera 24

**4. Measurements of Cornea** **26**
- Structure of cornea 26
- Endothelium 30
- Thickness of layers of cornea 32
- Corneal innervation 32
- Surface area of cornea 32
- Corneal diameter 32
- Microcornea 33
- Megalocornea 33
- Shape and curvature of cornea 35
- Normal variations of corneal curvature 35
- Measurement of corneal curvature and shape (Topography) 37
- Computerized corneal topography (Videokeratography) 39
- Refractive power 41
- Refractive index 41
- Corneal thickness 41
- Summary of measurements of cornea 44

**5. Measurements of Limbus** **46**
- Limit (extend) of limbus 46
- Structure of limbus (layer by layer changes) 47
- Functions and importance of limbus 47
- Vulnerability limbus to diseases (medial limbus) 48
- Diseases particularly affecting limbus and adjacent regions 48
- Dimensions of limbus 49
- Landmarks of limbus 49
- Zones of limbus 50
- Surgical anatomy and dimensions of limbus 51
- Cyclodestructive procedures 55
- Cataract surgery and limbus 56
- Postlimbal—scleral incision 58

**6. Measurements of Anterior Chamber** **62**
- Boundaries of anterior chamber 62
- Dimensions of AC and its normal variations 63
- Summary of measurements of anterior chamber 63
- Angle of anterior chamber 63
- Trabecular meshwork 64
- Aqueous humor 67
- Intraocular pressure 69
- Glaucoma 70
- Tonometry 71
- Tonography 75

**7. Measurements of Posterior Chamber** **81**
- Parts of posterior chamber 81
- Boundaries of posterior chamber (summary) 83
- Functions of posterior chamber 83
- Dimensions of posterior chamber 84

**8. Measurements of Uveal Tract** **85**
- Iris 85
- Pupil 89
- Ciliary body 91
- Choroid 96

**9. Measurements of Lens** **99**
- Dimensions of lens 99
- Structure and surgical anatomy of lens 102
- Summary of dimensions of lens 107

**10. Measurements of Zonules (of Zinn)** **109**
- Dimensions and extent of zonules 109
- Parts of zonules 110
- Zonular bundles 110
- Functions of zonules 111
- Summary of dimensions and extent of zonules 111

**11. Measurements of Vitreous Humor** **112**
- Structure of vitreous 112
- Primary, secondary and tertiary vitreous 113
- Vitreous topography 114
- Vitrectomy measurements 118

**12. Measurements of Retina** **126**
- General structure (architecture) of retina 127
- Summary of measurement of retinal layers 131
- Gross measurements and general features of retina 132
- Clinical and functional differentiations and measurements of optic disk, macula and peripheral retina 135
- Methods of evaluation of different portions of retina particularly the retinal nerve fiber layer 146
- Summary of measurements of retina 151

**13. Measurements of Optic Nerve** **152**
- Differences of optic nerve from other cranial nerves 152
- Structure and dimensions of various portions of optic nerve 153
- Variations in the arrangement of fibers in the distal and proximal portions of optic nerve 156
- In the proximal portion (chiasmal) of optic nerve 157
- Functions of optic nerve 158
- Summary of measurements of optic nerve 159

**14. Measurements of Optic Chiasma** **160**
- Dimensions of optic chiasma 161
- Position of optic chiasma in the cranial cavity 161
- Relations of optic chiasma 162
- Measurements of sella 165
- Variations in the relationship of optic chiasma to sella turcica and pituitary gland 165
- Arrangement of fibers in optic chiasma 167
- Common lesions affecting optic chiasma 168
- Visual field defects in chiasmal lesions 168
- Clues for clinical suspicion of chiasmal lesions 171

**15. Measurements of Eyebrows** **172**
- Dimensions of eyebrows 172
- Layers or structure of eyebrows 173
- Functions of eyebrows 174
- Clinical situations involving eyebrows 174

**16. Measurements of Eyelids** **178**
- Gross measurements of upper lid 178
- Structure of upper lid 178
- Palpebral fissure 186
- Relative levels of medial and lateral canthi 187

- Measurements of ptosis 189
- Measurements of lower lid 191
- Functions of eyelids 195
- Measurement of upper lid (gross) 195
- Measurements of individual eyelid structures 195

**17. Measurements of Lacrimal Apparatus** **197**
- Main lacrimal gland and its measurements 198
- Accessory lacrimal glands 199
- Lacrimal passages and their measurements 200
- Nasolacrimal duct 203
- Lacrimal sac surgery measurements 206

**18. Measurements of Orbit** **209**
- Dimension of orbits 209
- Bones and walls of orbit 211
- Orbit-eyeball relationship—normal and abnormal 213
- Walls of orbit 215
- Lateral wall of orbit 217
- Floor of orbit 219
- Medial wall of orbit 222
- Orbital apex 223
- Communications of orbit 225
- Optic canal 225
- Superior orbital fissure 227
- Inferior orbital fissure 228
- General configuration and surface marking of recti muscle insertions 232
- Dimensions of extraocular muscles 235
- Angle or meridian of insertion of extraocular muscles 236
- Visual axis, optic axis, center of rotation of eyeball, orbital planes and orbital axis 236
- Center of rotation of eyeball 238
- General principles and measurements in surgical correction of squints 239

*Suggested Readings* *243*

*Index* *245*