Contents

1 Introduction to Dental Anatomy, 1

Pretest Questions, 1
Formation of the Dentitions (Overview), 2
Nomenclature, 2
Formulae for Mammalian Teeth, 2
Tooth Numbering Systems, 2
Division Into Thirds, Line Angles, and Point Angles, 9
Tooth Drawing and Carving, 10
Measurement of Teeth, 11
Pretest Answers, 19

2 Development and Eruption of the Teeth, 20

Pretest Questions, 20
Clinical Considerations, 20
Variability, 21
Malformations, 21
Chronology of Primary Dentition, 21
Development and Eruption/Emergence of the Teeth, 22
Dentitions, 25

Neuromuscular Development, 28
Transitional (Mixed) Dentition Period, 29
Loss of Primary Teeth, 30
Permanent Dentition, 31

Size of Teeth, 32 Dental Pulp, 32

Cementoenamel Junction, 32

Dental Age, 33

Tooth Formation Standards, 34

Chronologies of Human Dentition, 35

Types of Chronologies, 35

Stages of Tooth Formation, 35

Age of Attainment, 35

Age Prediction, 36

Maturity Assessment, 36

Duration of Root and Crown Formation, 38

Summary of Chronologies, 38

Sequence of Eruption, 38

Estimating Time of Enamel Hypoplasia, 38

Pretest Answers, 39

3 The Primary (Deciduous) Teeth, 41

Pretest Questions, 41 Life Cycle, 41 Importance of Primary Teeth, 41 Nomenclature, 42 Major Contrasts Between Primary and Permanent Teeth, 43 Pulp Chambers and Pulp Canals, 43 Detailed Description of Each Primary Tooth, 46 Pretest Answers, 60

4 Forensics, Comparative Anatomy, Geometries, and Form and Function, 61

Pretest Questions, 61
Forensic Dentistry, 61
Comparative Dental Anatomy, 64
Facial and Lingual Aspects of All Teeth, 68
Summary of Schematic Outlines, 69
Form and Function of the Permanent Dentition, 69
Alignment, Contacts, and Occlusion, 70
Pretest Answers, 72

5 Orofacial Complex: Form and Function, 74

Pretest Questions, 74
Form and Function, 74
Form Follows Function, 74
Articulation of Teeth, 74
Physiologic Form of the Teeth and Periodontium, 75
Fundamental Curvatures, 75
Proximal Contact Areas, 75
Interproximal Spaces (Formed by Proximal Surfaces in Contact), 78
Embrasures (Spillways), 79
Contact Areas and Incisal and Occlusal Embrasures
From the Labial and Buccal Aspect, 81

Contact Areas and Labial, Buccal, and Lingual Embrasures From the Incisal and Occlusal Aspects, 82

Facial and Lingual Contours at the Cervical Thirds
(Cervical Ridges) and Lingual Contours at the

Middle Thirds of Crowns, 84

Height of Epithelial Attachment: Curvatures of the Cervical Lines (Cementoenamel Junction) Mesially and Distally, 86

Pretest Answers, 89

6 The Permanent Maxillary Incisors, 90

Pretest Questions, 90 Maxillary Central Incisor, 90 Maxillary Lateral Incisor, 97 Pretest Answers, 102

7 The Permanent Mandibular Incisors, 103

Pretest Questions, 103 Mandibular Central Incisor, 103 Mandibular Lateral Incisor, 109 Pretest Answers, 113

8 The Permanent Canines: Maxillary and Mandibular, 114

Pretest Questions, 114 Maxillary Canine, 115 Mandibular Canine, 121 Pretest Answers, 127

9 The Permanent Maxillary Premolars, 128

Pretest Questions, 128 Maxillary First Premolar, 129 Maxillary Second Premolar, 137 Pretest Answers, 141

10 The Permanent Mandibular Premolars, 142

Pretest Questions, 142 Mandibular First Premolar, 142 Mandibular Second Premolar, 149 Pretest Answers, 154

11 The Permanent Maxillary Molars, 155

Pretest Questions, 155
Maxillary First Molar, 156
Maxillary Second Molar, 164
Maxillary Third Molar, 168
Pretest Answers, 171

12 The Permanent Mandibular Molars, 172

Pretest Questions, 172
Mandibular First Molar, 172
Mandibular Second Molar, 181
Mandibular Third Molar, 185
Pretest Answers, 189

13 Pulp Chambers and Canals, 190

Pretest Questions, 190
Pulp, Chamber, and Canals, 190
Radiographs, 190
Foramen, 192
Demarcation of Pulp Cavity and Canal, 193
Pulp Horns, 193
Clinical Applications, 193
Pulp Cavities of the Maxillary Teeth, 194
Pulp Cavities of the Mandibular Teeth, 202
Radiographs: Pulp Chamber and Canals, 213
Crown and Root Fractures, 213
Pretest Answers, 216

14 Dento-Osseous Structures, Blood Vessels, and Nerves, 217

Pretest Questions, 217
The Maxillae, 217
The Mandible, 222
Arterial Supply to the Teeth, 229
Nerve Supply to the Jaws and Teeth, 231
Pretest Answers, 234

15 The Temporomandibular Joints, Teeth, and Muscles and Their Functions, 235

Pretest Questions, 235 Temporomandibular Articulation, 235 Muscles, 240 Mandibular Movements and Muscle Activity, 245 Pretest Answers, 248

16 Occlusion, 250

Pretest Questions, 250
Concepts of Occlusion, 250
Development of the Dentitions, 251
Primary Dentition, 251
Mixed (Transitional) Dentition, 254
Permanent Dentition, 256
Cusp, Fossa, and Marginal Ridge Relations, 263
Lateral Occlusal Relations, 266
Biomechanics of Chewing Function, 271
Neurobehavioral Aspects of Occlusion, 272
Oral Motor Behavior, 276
Swallowing, 277
Pretest Answers, 277

17 Clinical Application of Dental Anatomy, Physiology, and Occlusion, 280

Instrument Design/Usage Relating to Dental Anatomy, 280
Oral Surgery, 282
Periodontics, 284
Endodontics, 287
Restorative Dentistry, 288
Esthetics, 289
Variant Anatomy, 290
Occlusion, 291
Pretest Answers, 292

Pretest Questions, 280

Appendix A: Review of Tooth Morphology, 294

Appendix B: Tooth Traits of the Permanent Dentition, 311

Index, 321