A. Tooth Carving Demonstration
   1. Carving procedure of permanent maxillary central incisor
   2. Carving procedure of permanent maxillary canine
   3. Carving procedure of permanent maxillary 1st premolar
   4. Carving procedure of permanent mandibular 1st premolar
   5. Carving procedure of permanent mandibular 2nd premolar
   6. Carving procedure of permanent maxillary 1st molar
   7. Carving procedure of permanent mandibular 1st molar

B. Multiple Choice Questions with Answers for Self-assessment
# Contents

## Section 1: Introduction and Nomenclature

1. Introduction to Dental Anatomy
   - Dentitions in Humans 3
   - Trait Categories of Teeth 6
   - Nomenclature of Teeth 6
   - Dental Formulae in Humans 6
   - Stages of Dentitions in Humans 7
   - Parts of Tooth 7
   - Structure of Tooth 8
   - Basic Terminologies in Dental Anatomy 9
   - Anatomic Landmarks on Tooth Surface 10
   - Arbitrary Divisions of Crown and Root into Thirds 15
   - Divisions of the Root 16
   - Line Angles and Point Angles on the Crown 16
   - Measurements of Teeth 16

2. Tooth Notation Systems
   - Universal Notation System 22
   - Zsigmondy-Palmer System/Symbolic System/Quadrant System/Grid System/Angular System 24
   - FDI Notation System/Two-Digit System/ISO 3950 Notation/International Numbering System 26

## Section 2: Chronology of Tooth Development and Form and Function

3. Chronology of Tooth Development
   - Tooth Development: An Overview 33
   - Stages of Tooth Development 35
   - Root Formation 37
   - Eruption of Teeth 37
   - Dentition Stages in Humans 38
   - Primary Dentition Stage (6 Months to 6 Years) 38
   - Mixed Dentition Stage (6–12 Years) 43
   - Permanent Dentition Stage (12 Years and Beyond) 44
   - Dental Age 46

4. Form and Function of Orofacial Complex
   - Size of Crown and Root 51
   - Tooth Form and Jaw Movements 51
   - Interproximal Spaces and Protection of Interdental Gingiva 52
   - Proximal Contact Areas 54
   - Embrasures (Spillways) 56
   - Facial and Lingual Physiologic Contours of Teeth 59
   - Curvatures of Cervical Line (CEJ): Mesially and Distally 60
SECTION 3: DECIDUOUS DENTITION

5. Primary (Deciduous) Dentition
- Dental Formula for Primary Dentition
- Significance of Deciduous Dentition
- Detailed Description of Each Primary Tooth

Deciduous Incisors
- Deciduous Maxillary Central Incisor
- Deciduous Maxillary Lateral Incisor
- Deciduous Mandibular Central Incisor
- Deciduous Mandibular Lateral Incisor

Deciduous Canines
- Deciduous Maxillary Canine
- Deciduous Mandibular Canine

Deciduous Molars
- Deciduous Maxillary 1st Molar
- Deciduous Maxillary 2nd Molar
- Deciduous Mandibular 1st Molar
- Deciduous Mandibular 2nd Molar

6. Differences between Primary and Permanent Dentitions

SECTION 4: PERMANENT DENTITION

7. The Permanent Maxillary Incisors
- Functions of Incisors
- Common Characteristics (Class Traits) of All Incisors

Permanent Maxillary Central Incisor
- Detailed Description of Maxillary Central Incisor from All Aspects
  - Crown
  - Root
  - Variations
  - Developmental Anomalies
  - Clinical Considerations

Permanent Maxillary Lateral Incisor
- Detailed Description of Maxillary Lateral Incisor from All Aspects
  - Crown
  - Root
  - Variations
  - Developmental Anomalies
  - Clinical Considerations

8. The Permanent Mandibular Incisors
- Permanent Mandibular Central Incisors
- Detailed Description of Mandibular Central Incisor from All Aspects
  - Crown
  - Root
  - Variations
  - Developmental Anomalies

- Permanent Mandibular Lateral Incisors
- Detailed Description of Mandibular Lateral Incisor from All Aspects
  - Crown
  - Root
  - Variations
  - Developmental Anomalies

- Permanent Mandibular Canines
- Detailed Description of Mandibular Canines
  - Crown
  - Root
  - Variations
  - Developmental Anomalies

- Permanent Mandibular Molars
- Detailed Description of Mandibular Molars
  - Crown
  - Root
  - Variations
  - Developmental Anomalies
Permanent Mandibular Lateral Incisors 132
Detailed Description of Mandibular Lateral Incisor from All Aspects 134
Crown 134
Root 139
Variations 139
Developmental Anomalies 140

9. The Permanent Canines 141
Functions 141
Common Characteristics (Class Traits) of Permanent Canines 141
Permanent Maxillary Canine 142
Detailed Description of Maxillary Canine from All Aspects 142
Crown 144
Root 146
Variations 146
Developmental Anomalies 146
Clinical Considerations 146
Permanent Mandibular Canine 147
Detailed Description of Mandibular Canine from All Aspects 148
Crown 148
Root 153
Variations 154
Clinical Considerations 154

10. The Permanent Maxillary Premolars 156
Functions 156
Common Characteristics (Class Traits) of Premolars 156
Maxillary Permanent 1st Premolar 156
Detailed Description of Maxillary 1st Premolar from All Aspects 157
Crown 157
Root 162
Variations 163
Developmental Anomalies 163
Clinical Considerations 163
Maxillary Permanent 2nd Premolar 163
Detailed Description of Maxillary 2nd Premolar from All Aspects 163
Crown 163
Root 169
Variations 169
Developmental Anomalies 169
Clinical Considerations 169

11. The Permanent Mandibular Premolars 172
Permanent Mandibular 1st Premolar 172
Detailed Description of Mandibular 1st Premolar from All Aspects 173
Crown 173
Root 177
Variations 177
Developmental Anomalies 177
Clinical Considerations 177
Permanent Mandibular 2nd Premolar 178
Detailed Description of Mandibular 2nd Premolar from All Aspects 179
12. The Permanent Maxillary Molars

Common Characteristics (Class Traits) of Molars 188
Functions of Molars 188

Permanent Maxillary 1st Molar 188
Detailed Description of Maxillary 1st Molar from All Aspects 189
Crown 189
Root 195
Variations 196
Developmental Anomalies 196
Clinical Considerations 196

Permanent Maxillary 2nd Molar 196
Detailed Description of Maxillary 2nd Molar from All Aspects 197
Crown 197
Root 203
Variations 203
Developmental Anomalies 203

Permanent Maxillary 3rd Molar 203
Detailed Description of Maxillary 3rd Molar from All Aspects 204
Crown 204
Root 206
Variations 206
Clinical Considerations 210

13. The Permanent Mandibular Molars

Permanent Mandibular 1st Molar 211
Detailed Description of Mandibular 1st Molar from All Aspects 211
Crown 211
Root 217
Variations 217
Developmental Anomalies 217
Clinical Considerations 217

Permanent Mandibular 2nd Molar 217
Detailed Description of Mandibular 2nd Molar from All Aspects 219
Crown 219
Root 224
Variations 224
Developmental Anomalies 224

Permanent Mandibular 3rd Molar 224
Detailed Description of Mandibular 3rd Molar from All Aspects 224
Crown 224
Root 229
Variations 230
Developmental Anomalies 231
Clinical Considerations 231
14. Pulp Morphology
   The Terminology 233
   Age Related Changes in Pulp Morphology 235
   Clinical Applications 235
   Detailed Description of Pulp Anatomy of Permanent Teeth 236
      Maxillary Teeth 236
      Mandibular Teeth 239

Section 5: Class, Arch and Type Traits of Teeth

15. Class, Arch and Type Traits of Incisor Teeth 247
16. Class and Arch Traits of Canine Teeth 255
17. Class, Arch and Type Traits of Premolar Teeth 259
18. Class, Arch and Type Traits of Molar Teeth 267

Section 6: Dento-osseous Structures: Temporomandibular Joint

   Skull and Jaws at Birth 279
   Development of Skull/Craniofacial Complex 279
   Bones of Neurocranium 280
   Viscerocranium/Face 280
   Maxilla 280
   Mandible 282
   Blood Supply 286
   Venous Drainage of Orodental Tissues 287
   Lymphatic Drainage of Orodental Tissues 288
   Nerve Supply to Orodental Tissues 289
   Trigeminal Nerve (Fifth Cranial Nerve) 290
   Innervation of Maxilla 292
   Innervation of Mandible 292
   Innervation of Palate and Lips 292

20. Temporomandibular Joint 294
   Articular Surfaces 294
   Intra-articular Disk 294
   Fibrous Capsule 295
   Ligaments of TMJ 295
   Blood and Nerve Supply to TMJ 296
   Muscles of the Joint 296
   Mandibular Movements and Muscle Activity 297
   Functions of TMJ, Teeth and Muscles 299
   Mastication 299
   Deglutition 299
   Speech 300
SECTION 7: OCCLUSION

21. Occlusion 305
   Terms Commonly Used in Discussions about Occlusion and Malocclusion 305
   Development of Occlusion 306
   Characteristics of Occlusion in Deciduous Dentition 307
   Characteristics of Occlusion in Permanent Dentition 315
   Types of Cusps 315
   Centric Occlusal Contacts 316
   Tooth Guidance 317
   Imaginary Occlusal Planes and Curves 318

SECTION 8: EVOLUTION OF TEETH, COMPARATIVE DENTAL ANATOMY, FORENSICS AND DENTAL ANTHROPOLOGY

22. Evolution of Teeth, Comparative Dental Anatomy and Forensic Odontology 323
   Evolution of Teeth 323
   Comparative Dental Anatomy 325
   Forensic Odontology 330

23. Dental Anthropology 332
   Branches/Subfields of Anthropology 332
   Dental Anthropology 333
   Metric Variation in Teeth 334
   Non-metric Variations in Teeth 334

SECTION 9: TOOTH CARVING

24. Tooth Carving 341
   Rationale of Tooth Carving 341
   Armamentarium 341
   General Principles of Carving 342
   Preliminary Steps 343
   Carving of Maxillary Central Incisor 344
   Carving of Maxillary Lateral Incisor 346
   Carving of Mandibular Central Incisor 346
   Carving of Mandibular Lateral Incisor 346
   Carving of Maxillary Canine 346
   Carving of Mandibular Canine 349
   Carving of Maxillary 1st Premolar 349
   Carving of Maxillary 2nd Premolar Carving 352
   Carving of Mandibular 1st Premolar 353
   Carving of Mandibular 2nd Premolar 355
   Carving of Maxillary 1st Molar 356
   Carving of Maxillary 2nd Molar 360
   Carving of Mandibular 1st Molar 360
   Carving of Mandibular 2nd Molar 362
   Index 365