Paper II: Technical Subject

1. Introduction and History of Orthodontics
   1.1 Definition, history, aims and objective of Orthodontics
   1.2 Branches of Orthodontics
   1.3 Scope of Orthodontics

2. Growth and Development
   2.1 Basic concept of Embryology and Genetics
   2.2 Concept of growth, development, differentiation and maturation
   2.3 Various theories of Growth: Genetic theory, Sutural growth theory, Cartilagenous growth theory, Functional matrix theory, Van Limborgh’s Theory, Enlow’s Principle and Cybernetic theory
   2.4 Factors affecting growth
   2.5 Bone, Cartilage, Sutures, Synchondrosis
   2.6 Pre-natal and Post-natal growth of Stomatognathic system
   2.7 Types of Bone Growth: Intra-membranous and Endochondrial

3. Occlusion
   3.1 Introduction and phases of occlusion (pre-dentate, primary, mixed, permanent)
   3.2 Types of occlusion: Normal, Physiologic, Therapeutic, Centric and Eccentric
   3.3 Angle’s keys of normal molar relation
   3.4 Andrew’s keys of normal occlusion
   3.5 Components of masticatory system

4. Malocclusion
   4.1 Definition
   4.2 Classification
      4.2.1 Angle classification with Dewey’s modification
      4.2.2 Ackermann & Profitt classification
      4.2.3 Lischer Classification
      4.2.4 Simon Classification
   4.3 Etiology
      4.3.1 Graber’s etiological classification
      4.3.2 Moyer’s etiological classification
   4.4 Epidemiology/ Indices

5. Orthodontic Diagnosis
   5.1 Introduction/ History taking
   5.2 Diagnostic aids: essential diagnostic aids and supplemental diagnostic aids
   5.3 Study model, Radiographs, photographs in Orthodontics

6. Cephalometry
   6.1 Introduction, History
   6.2 Application
   6.3 Cephalometric analyses: Steiner’s, Down’s, Tweeds, McNamara and Wit’s appraisal
7. Model analyses
   7.1 Introduction and uses
   7.2 Model analysis : Arch Perimeter/ Carey’s, Bolton, Pont and Ashley Howe
   7.3 Mixed Dentition analysis : Moyer’s and Tanaka Johnson

8. Orthodontic materials
   8.1 Introduction, classification and uses
   8.2 Physical and chemical properties of orthodontic wires: Stainless Steel, Nickel Titanium, TMA/ Beta Titanium and Copper NiTi
   8.3 Orthodontic impression materials, adhesives, cements, etchant
   8.4 Orthodontic brackets, bands, auxiliaries/accessories
   8.5 Elastics and Elastomerics
   8.6 Welding and Soldering

9. Preventive Orthodontics
   9.1 Definition/ Scope
   9.2 Types of preventive measures
   9.3 Significance related to orthodontics

10. Interceptive Orthodontics
    10.1 Definition/ Scope
    10.2 Types of interceptive measures
    10.3 Growth guidance
    10.4 Significance related to orthodontics

11. Habit
    11.1 Introduction/Definition
    11.2 Etiology
    11.3 Classification /Types of oral habits : Thumb/digit sucking, Tongue thrusting, Mouth breathing, Lip/nail habits and Bruxism/ grinding habits
    11.4 Deleterious effects of habits
    11.5 Management /Treatment of habits

12. Biology of tooth movement
    12.1 Introduction
    12.2 Types of Orthodontic Force : Continuous, Intermittent and Interrupted
    12.3 Types of tooth movement
    12.4 Tissue reaction to different types of orthodontic tooth movement (OTM)
    12.5 Optimal orthodontic force
    12.6 Phases of Orthodontic tooth movement : Initial phase, Lag phase and Post-lag phase
    12.7 Tissue hyalinization
    12.8 Effects of Drugs on OTM
    12.9 Deleterious effects of OTM

13. Biomechanics in Orthodontics
    13.1 Introduction/ Definition
    13.2 Force, Moment, Couple
    13.3 Center of rotation, Center of Resistance
Types of tooth movement
13.5 Sliding mechanics / Loop mechanics / ‘V’ bends
13.6 Canine retraction / En masse retraction

14. Anchorage
14.1 Introduction / Definition
14.2 Source / Types / Classification
14.3 Anchorage preparation / planning
14.4 Anchorage loss
14.5 TPA / LHA / Nance palatal button
14.6 Use of Mini-implant anchorage (TAD)

15. Methods of gaining space
15.1 Introduction / Indication
15.2 Proximal stripping
15.3 Extraction
15.4 Arch expansion
15.5 Distalization
15.6 Derotation of posterior tooth
15.7 Anterior proclination
15.8 Uprighting of posterior tooth

16. Functional / Myofunctional appliances
16.1 Introduction / Definition / Scope
16.2 Basic principles
16.3 Classification / Types of appliance : Monoblock, Twinblock, Activator, Bionator, Frankel’s regulators and Fixed functional appliances
16.4 Contemporary appliances / Mode of action

17. Orthopedic Appliances
17.1 Introduction / Definition / Scope
17.2 Basic principles
17.3 Classification / Types of appliance : Headgear, Chin cup and Facemask
17.4 Contemporary appliances / Mode of action

18. Removable Appliances
18.1 Introduction / Definition / Scope
18.2 Basic principles / Mode of action
18.3 Classification / Types of appliance
18.4 Parts / Components

19. Fixed Appliances
19.1 Introduction / Definition / Scope
19.2 Basic principles
19.3 Classification / Types of appliance
19.4 Phases of fixed orthodontic treatment
19.5 Contemporary appliances / Mode of action
19.5.1 Standard Edgewise appliance
20. Corrective Orthodontics
   20.1 Correction of Antero-posterior discrepancies: Treatment of Class I, Class II and Class III malocclusion
   20.2 Correction of Vertical discrepancies: Treatment of open bite and deep bite
   20.3 Correction of transverse discrepancies: Treatment of cross bite and scissor bite

21. Surgical Orthodontics
   21.1 Introduction, Scope, Indication, Contraindication, Hazard, Limitations
   21.2 Types/ Procedures of surgical orthodontics
      21.2.1 Minor surgical procedures - Extraction, Frenectomy, Pericision, Surgical exposure of impacted tooth, Osteotomies
      21.2.2 Major surgical procedures - Orthognathic surgery, Distraction osteogenesis
   21.3 Extraction in Orthodontics
      21.3.1 Indication/ Contraindication
      21.3.2 Types of orthodontic extraction: Serial extraction, Balancing extraction, Compensatory extraction, Therapeutic extraction and Enforced extraction

22. Craniofacial Anomalies
   22.1 Introduction
   22.2 Classification/ Types
   22.3 Clinical significance in relation to orthodontics
   22.4 Etiology / Pathology of Cleft lip and palate
   22.5 Management/ Treatment / Rehabilitation of Cleft lip and palate

23. Adult Orthodontics
   23.1 Introduction/ Scope
   23.2 Adult patient Vs adolescent patient
   23.3 Modalities for adult orthodontics
   23.4 Adjunctive Orthodontics
   23.5 Treatment considerations/ Limitations

24. Interdisciplinary Orthodontics
   24.1 Introduction/ Scope
   24.2 Ortho-Perio relationship
   24.3 Ortho-Prostho relationship
   24.4 Ortho- Resto/Endo relationship
   24.5 Ortho-Surgery relationship
   24.6 Community-based Orthodontics

25. Retention and Relapse
   25.1 Introduction/ Definition
   25.2 Causes of relapse
25.3 Schools of retention
25.4 Theorems of retention
25.5 Post-retention stability
25.6 Classification/Types of retainers: Hawley’s retainer, Wrap-around, Clip-on retainer, Begg’s retainer, Fixed lingual retainer and Clear retainer

26. Recent advances in orthodontics
   26.1 Clear aligner
   26.2 Temporary anchorage device (TAD)
   26.3 Advanced imaging- CBCT, CAD-CAM
   26.4 Laser in orthodontics
   26.5 Management of Obstructive Sleep Apnea