

**पाटन स्वास्थ्य विज्ञान प्रतिष्ठान, सेवाआयोग**  
**प्राज्ञिक सेवा, दन्त चिकित्सा समूह, Orthodontic उपसमूह, सहायक प्राध्यापक पद,**  
**(९ख) तहको खुला र आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम**  
**एवं परीक्षायोजना**

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजनगरिएको छ :

**प्रथम चरण :-** लिखित परीक्षा (Written Examination)

पूर्णाङ्क :- २००

**द्वितीय चरण :-** अन्तर्वार्ता (Interview)

पूर्णाङ्क :- ३०

**प्रथम चरण (First Phase) : लिखित परीक्षा योजना (Written Examination Scheme)**

Paper	Subject		Marks	Full Marks	Pass Marks	No. Questions & Weightage		Time Allowed
I	General Subject	Part I: Management, General Health Issues, Academic Research and Teaching-Learning Practices	50	100	40	10 ×5 = 50 (Subjective)	1.30 hrs	2.15 hrs
		Part II: Technical Subject (Relevant Subject)	50			50 ×1 = 50 (Objective Multiple Choice)	45 min	
II	Technical Subject (Relevant Subject)			100	40	7 ×10 = 70 (Long answer) 2 ×15 = 30 (Critical Analysis)		3.00 hrs
द्वितीय चरण(Second Phase)								
	Interview			30		Oral		

**द्रष्टव्य :**

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुन सक्नेछ ।
- प्रतिष्ठानको प्राज्ञिक सेवा अन्तर्गत समान तहका सबै समूह/सबै उपसमूहहरूको लागि प्रथमपत्रको Part I पाठ्यक्रमको विषयवस्तु एउटै हुनेछ र एकै पटक परीक्षा संचालन हुनेछ ।
- प्रथम पत्रको Part II र द्वितीयपत्रको पाठ्यक्रम समूह/उपसमूह अनुरूप फरक फरक हुनेछ ।
- प्रथम पत्रको Part II र द्वितीय पत्रको विषयवस्तु एउटै समूह/उपसमूहहरूको हकमा समान हुनेछ ।
- प्रथम पत्रको Part II र द्वितीय पत्रको परीक्षा संचालन एकै दिन फरक समयमा हुनेछ ।
- वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।
- वस्तुगत बहुवैकल्पिक हुने परीक्षामा परीक्षार्थीले उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital letter) A,B,C,D मा लेख्नुपर्नेछ । सानो अक्षर (Small letter) a, b, c, d लेखेको वा अन्य कुनै सङ्केत गरेको भए उक्त उत्तर रद्द हुनेछ ।
- बहुवैकल्पिक प्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नहरूको हकमा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिने छ ।
- विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको परीक्षाबाट उत्तिर्ण भई छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम लागु मिति : २०८१/१२/०४

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**Paper I: General Subject**

**Part I: (Management, General Health Issues, Academic Research and Teaching-Learning Practices)**

**Section (A) – 20 Marks**

**1. Management**

- 1.1. Health care management system in Nepal and other parts of the world
- 1.2. Fundamental principles of healthcare institution and hospital management.
- 1.3. Effective hospital management principles
- 1.4. Purpose of medical and non-medical data and records
- 1.5. Ethics and responsibility of management
- 1.6. Concept of management and its application in health care including hospital
- 1.7. Management: Concept, principles, functions, scope and role, level and skills of manager
- 1.8. Planning: Concept, principles, nature, types, instruments and steps
- 1.9. Leadership: Concept, function, leadership styles, leadership and management
- 1.10. Coordination: Concept, types, techniques of effective coordination
- 1.11. Communication and counselling: Concept, communication processes and barrier to effective communication, techniques for improving communication
- 1.12. Decision making: Importance, types, rational process of decision making, problem solving techniques, improving decision making
- 1.13. Participative management: Concept, advantage and disadvantage, techniques of participation
- 1.14. Time management: Concept, essential factors and strategies for effective time management
- 1.15. Conflict management: Concept, approaches to conflict, levels of conflict, causes of conflict and strategies for conflict management
- 1.16. Stress management: Concept, causes and sources of stress, techniques of stress management
- 1.17. Change management: Concept, sources of organizational change, resistance to change, management of resistance to change
- 1.18. Appreciative inquiry: Concept, basic principle and management
- 1.19. Human resource management: Concept, functions and different aspects
- 1.20. Health manpower recruitment and development
- 1.21. Financial management: Concept, approaches, budget formulation and implementation, Auditing and topics related to fiscal administration

**2. General Health Issues**

- 2.1. Present constitution of federal republic of Nepal (including health and welfare issues)
- 2.2. Organizational structure of Ministry of Health at national/federal, regional/state, district (if applicable), municipal and village council level
- 2.3. Professional council and related regulations
- 2.4. National Health Policy
- 2.5. Health Service Act and Regulation
- 2.6. Second Long term health plan
- 2.7. Health Management Information System, forms, indicators, annual reports
- 2.8. Human Development Indices, Sustainable Development Goals
- 2.9. Health volunteers in the national health system, its rationale, use and effectiveness
- 2.10. Local governance and community participation in health service delivery
- 2.11. Health Insurance and financing in health care
- 2.12. Alternative health care system: Ayurveda, homeopathy, Unani, Chinese etc.
- 2.13. Indigenous and traditional faith health and health practices
- 2.14. International Health Agencies: Roles and responsibilities of WHO, UNICEF, UNFPA, Inter-agency relationships, Government-agency coordination: Joint Annual Review meeting
- 2.15. Supervision, types and its usage in health sector
- 2.16. Monitoring and evaluation system in health sector
- 2.17. National Health Training Centre

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- 2.18. National and International Disaster Plan, Coordination
- 2.19. Patan Academy of Health Sciences Act, Mission, Goals, Organogram
- 2.20. Scope and function of Patan Academy of Health Sciences executive bodies (senate, executive committee, academic council, faculty board, hospital management committee, subject committee), various other committees

**Section (B) - 30 Marks**

**3. Academic Research**

- 3.1 Ethics, Bio-ethics and Professionalism
- 3.2 Human dignity and Human Right
- 3.3 Benefit and Harm
- 3.4 Autonomy and Individual responsibility
- 3.5 Consent and capacity to consent
- 3.6 Privacy and confidentiality
- 3.7 Respect for humans and personal integrity
- 3.8 Non-discrimination and non-stigmatization
- 3.9 Respect for cultural diversity and pluralism
- 3.10 National Health Research Council (NHRC) and its guidelines
- 3.11 Research process: ethical research proposal development, research principles, methods and materials, conclusion/recommendation/lesson learnt, commonly used referencing styles
- 3.12 IRB/IRC forms, types, use, importance; getting IRB/IRC clearance
- 3.13 Ethics on research methodology: sample selection, sample size calculation, ensuring reliability and validity of the instruments as well as methods proposed for health research
- 3.14 Quantitative and Qualitative studies
- 3.15 Data analysis (data visualization, descriptive statistics, inferential statistics with statistical hypotheses and appropriate tools/methods for quantitative studies; theme and code generation, thematic analysis, content analysis, grounded theory for qualitative and triangulation for mixed method studies)
- 3.16 Research ethics on vulnerable and non-vulnerable population
- 3.17 Research proposal/protocol/publication:
- 3.18 Publication ethics, plagiarism including self-plagiarism

**4. Teaching-Learning, Assessment and Evaluation**

- 4.1 Lancet Commission Report on Education of Health Professionals
- 4.2 Adult learning: Theories, principles, use, importance and outcomes, Andragogy vs. Pedagogy
- 4.3 Conventional teaching-learning: Didactic lectures, Teacher centred approaches, use and importance
- 4.4 Surface learning, deep learning and metacognition
- 4.5 Integrated teaching: Genesis, use, importance and outcomes
- 4.6 Problem-based learning: Genesis, use, importance and outcomes
- 4.7 SPICES model its use, importance and outcomes
- 4.8 Socialization, self-directed learning, mentoring, role model
- 4.9 Community orientation/community posting, re-orientation of medical education camp, community based learning and community engaged teaching-learning methods/models, use, importance and outcomes
- 4.10 Outcome Based Education (Competency-based Medical/Health Professions Education): Genesis, use, importance and outcomes
- 4.11 Experiential learning, Reflective practice, Feedback and feed-forward, Situated learning, Co-operative learning, Communities of practice
- 4.12 Assessment of students
  - 4.12.1 Blueprinting (Table and specification) : use, importance and outcomes
  - 4.12.2 Bloom's taxonomy of cognitive, psychomotor and affective domains, use and importance
  - 4.12.3 Diagnostic, Formative, Summative and Professional exams

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- 4.13 Assessment of knowledge: Selection methods like Multiple Choice Questions, Extended Matching Items and supply methods like Short Answer Question, Problem Based Question, Long Answer Question with or without model answers and marking schemes, unstructured, semi-structured and structured viva-voce examination, advantages and limitations, use and importance, outcomes and its use in quality control
- 4.14 Assessment of performance (in-vitro): Direct observation of skills in the simulated setting, lab, ward etc. with or without checklist, Objective Structured Practical Examination, Objective Structured Clinical Examination, Standardized patients, use and importance, analysis, quality assurance, outcomes and its use in quality control
- 4.15 Assessment of performance (in-vivo): Mini-Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedural Skills (DOPS), Case-Based Discussion (CbD), OSATS/ PBA, Multi-Source feedback (360 degree evaluation) use and importance for competency based health professions education, analysis, quality assurance, outcomes and its use in quality control
- 4.16 Assessment of observable behaviours in small groups e.g. Problem Based Learning sessions, Community Based Learning and Education sessions, Clinical clerkship rotations
- 4.17 Evaluation: Difference between assessment and evaluation, theory of change and its use in health professions education, process and outcome evaluation, qualitative, quantitative and mixed methods used in evaluation of health professions education

**Paper I**  
**Part II: Technical Subject**  
**Section (C) - 25 Marks**  
**Orthodontic**

**1. Introduction and History of Orthodontics:**

- ☐ Introduce and define Orthodontics.
- ☐ Enumerate and explain aims and objectives of Orthodontics.
- ☐ Discuss different branches of Orthodontics.
- ☐ Discuss history and evolution of Orthodontics from ancient civilization till date.

**2. Growth and development:**

- ☐ Explain basic concept of embryology.
- ☐ Explain basic principles of growth -
  - ☐ Introduce and define common terminologies used in growth and development.
  - ☐ Define and explain features of normal growth and development.
  - ☐ Understand methods of studying physical growth.
  - ☐ Classify, enumerate, and explain factors affecting growth and development.
- ☐ Enumerate and explain different growth theories.
- ☐ Enumerate and explain types of bone, sutures, synchondroses, and concept of bone growth.
- ☐ Discuss the growth and development of different parts of craniofacial structures and its clinical implication in orthodontics i.e.
  - ☐ Explain Pre- and post-natal growth and development of skull.
  - ☐ Explain Pre- and Post- natal growth and development of face, eye, ear and facial muscles.
  - ☐ Explain Pre- and Post- natal growth and development of Naso -maxillary complex.
  - ☐ Explain Pre- and Post- natal growth and development of mandible.
  - ☐ Explain Pre- and Post- natal growth and development of oral structures, palate, tongue, salivary glands, TMJ and MS of Mastication.
  - ☐ Role of condyle in the growth of mandible.
- ☐ Understand development of dentition before and after birth
  - ☐ Explain the different stages of tooth development, development of supporting structures and mechanism of tooth eruption.
  - ☐ Explain development of dentition from birth to adulthood.
- ☐ Become familiar with the normal and abnormal psychosocial development of an individual and its clinical implication in relation to orthodontics i.e.

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- ☐ Explain how different behaviors are learned and developed.
- ☐ Explain stages of emotional and cognitive development.
- ☐ Understand the adolescent patient as compared to adult patient and define the role of orthodontist in handling them.
- ☐ Understand the role of psychology in development of deleterious habits.
- ☐ Understand the social psychology of Orthodontics.
- ☐ Explain the Psychological outcomes of orthodontic treatment.
- ☐ Manage physically and mentally compromised child for orthodontic treatment.
- ☐ Understand the psychology of abused children to treat them.

**3. Occlusion in Orthodontics :**

- ☐ Introduce and define common terminologies used in occlusion.
- ☐ Enumerate and explain the components of Masticatory System.
- ☐ Explain mandibular movements and neuromuscular control of TMJ movements.
- ☐ Explain the components of Functional Occlusion.
- ☐ Describe and record different types of Mandibular movements.
- ☐ Examine different muscles of mastication.
- ☐ Identify and use different types of articulators, record centric occlusion, perform face bow transfer and perform occlusal analysis and occlusal grinding.

**4. Classification, Etiology and Epidemiology of Malocclusion:**

- ☐ Define malocclusion, and identify skeletal as well as dental malocclusion i.e.
- ☐ Define, identify and explain need for classification of malocclusion.
- ☐ Define common terminologies used in malocclusion.
- ☐ Define, classify and identify skeletal malocclusion in all planes.
- ☐ Enumerate and define different classification of dental malocclusion.
- ☐ Explain Ackerman-Proffit Classification.
- ☐ Understand different etiological factors responsible for causing malocclusion i.e.
- ☐ Enumerate different types of classification of malocclusion.
- ☐ Enumerate Graber's classification of etiology of malocclusion.
- ☐ Enumerate and explain local causes of malocclusion.
- ☐ Enumerate and explain Systemic causes of malocclusion.
- ☐ Understand epidemiology of malocclusion i.e.
- ☐ Describe epidemiology of malocclusion.
- ☐ Explain indices for orthodontic treatment need.
- ☐ Evaluate demand for orthodontic treatment.

**5. Orthodontic Diagnosis and Treatment Planning:**

- ☐ Classify essential and non-essential diagnostic aids.
- ☐ Take detailed case history of an orthodontic patient.
- ☐ Perform extra-oral, intra-oral and functional examination of the orthodontic patients.
- ☐ Make an ideal study model and use them for diagnostic purpose i.e.
- ☐ Understand and fabricate study models.
- ☐ Perform different types of model analysis in children and adult patients.
- ☐ Use IOPA, Bite wing and OPG x-rays for Orthodontic purposes.
- ☐ Take extra- and intra- oral photographs for orthodontic purposes and analyze them.
- ☐ Explain the Principles of Form.
- ☐ Understand the facial analysis methods.
- ☐ Understand the "Facial Points of Interest".
- ☐ Undertake Basic Facial Analysis.
- ☐ Undertake analysis of Forehead, Eyebrows, and Eyes.
- ☐ Perform Nasal Analysis.
- ☐ Perform Lips, Teeth, Chin, and Smile Analysis.

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- ☐ Understand and perform analysis of dentofacial deformities cases.
- ☐ Understand about different aspects of aging face.
- ☐ Understand the role of orthodontic rehabilitation for aesthetic purposes in different conditions.
- ☐ Use Cephalometry for diagnosis and treatment planning of Orthodontic Cases i.e.
  - ☐ Define, understand and take cephalometric radiographs.
  - ☐ Identify points, planes and angles.
  - ☐ Trace all important anatomical landmarks.
  - ☐ Carry out contemporary analyses.
  - ☐ Perform Visualizing Treatment Objectives.
  - ☐ Predict Growth.
- ☐ Understand other supplemental diagnostic aids and use them when necessary
  - ☐ Enumerate specialized radiographs for orthodontic purpose.
  - ☐ Explain Occlusograms.
  - ☐ Understand EMG and use it for research purpose.
  - ☐ Understand CT.
  - ☐ Basic knowledge of MRI.
  - ☐ Explain the role of endocrinology, BMR, Sensitivity tests and Biopsy in Orthodontics.
- ☐ Understand and use recent advances in Cephalometry i.e.
  - ☐ Enumerate and explain recent advances in Cephalometry.
  - ☐ Use computer aided cephalometric tracing programs.
- ☐ Analyze the data and develop problem list.
- ☐ Develop a comprehensive treatment plan for the patient including mechanotherapy i.e.
  - ☐ Understand treatment planning concepts and goals.
  - ☐ Plan Treatment for Moderate Problems.
  - ☐ Plan Comprehensive Orthodontic Treatment.
  - ☐ Understand common mistakes and sources of error in treatment planning.

**6. Orthodontic Materials and Their Uses:**

- ☐ Understand general principles of orthodontic materials
  - ☐ Explain the evolution of orthodontic biomaterials to date.
  - ☐ Explain basic physical and chemical properties of orthodontic materials.
  - ☐ Understand the different mechanical testing methods for orthodontic materials.
  - ☐ Enumerate and explain common techniques for study of orthodontic materials.
  - ☐ Classify orthodontic materials.
- ☐ Familiar with different types of orthodontic wires and their uses
  - ☐ Introduce what orthodontic wires are, their types and uses.
  - ☐ Explain the physical properties of wire.
  - ☐ Explain evolution and types of orthodontic arch wires and their comparative properties.
- ☐ Differentiate between programmed and non-programmed orthodontic brackets, and enumerate and explain different types of contemporary bracket systems.
- ☐ Familiar with elastics and elastomers used in orthodontics.
- ☐ Familiar with different types of impression materials used in orthodontics i.e.
  - ☐ Classify impression materials and explain their properties.
  - ☐ Understand different techniques and art of taking orthodontic impression clinically.
- ☐ Familiar with different types of materials used to construct orthodontic study models
  - ☐ Plaster of Paris.
  - ☐ Hard Plaster.
- ☐ Familiar with different types of orthodontic adhesives and cements and their uses
  - ☐ Explain different types of Adhesive resins and composites, their properties and their uses.
  - ☐ Explain and use different cements in orthodontics.
- ☐ Enumerate and use different types of Separators used in orthodontics.
- ☐ Apply different types and techniques of Banding.
- ☐ Ready to start bonding and debonding procedures clinically

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- ☐ Etch enamel.
- ☐ Have sound knowledge of bonding.
- ☐ Bond brackets to non conventional surfaces.
- ☐ Debond brackets effectively and clean and remove adhesives properly.
- ☐ Make different kinds of bends, shapes arch forms in different wires
  - ☐ Introduce wire bending and its importance.
  - ☐ Commonly used pliers, instruments, and material.
  - ☐ Manipulate wire for different purposes in orthodontic mechanics.
  - ☐ Enumerate different types of Arch forms.
  - ☐ Make 1st order bends.
  - ☐ Make 2nd order bends.
  - ☐ Make 3rd order bends.
  - ☐ Explain and perform heat treatment and annealing.
  - ☐ Explain clinical indications of loops.
- ☐ Do soldering and welding for orthodontic purposes
  - ☐ Define and explain dental solders, flux, anti-flux, types of soldering and application in orthodontics.
  - ☐ Explain principles of Welding and apply them clinically.
- ☐ Identify the harmful effects of orthodontic materials, take necessary precautions to avoid them and manage those effects when they occur.
- ☐ Understand and explain principles of biocompatibility and measure them.
- ☐ Familiar with allergic reactions produced by orthodontic materials, and recognize, prevent and manage them when encountered.
- ☐ Recognize effects of microbial flora changes during orthodontic treatment and to prevent and manage them.

7. Biomechanics :

- ☐ Understand and apply forces in a tooth or group of teeth to produce desired movement
- ☐ Introduce principles of bioengineering and biophysics, orthodontic force system, and sign conventions.
- ☐ Define and explain force, moment, couple, centre of rotation, centre of resistance, and load deflection rate.
- ☐ Understand types of tooth movements.
- ☐ Identify of center of rotation according to type of tooth movement.
- ☐ Explain concept and use moment to force ratio for desired orthodontic tooth movement.
- ☐ Explain and use sliding mechanics in orthodontics.
- ☐ Discuss the principles and use of V-bends.
- ☐ Understand and use segmented technique in orthodontics.
- ☐ Understand principles of deep bite correction, Canine retraction and En masse incisor retraction.
- ☐ Make and use Transpalatal Arch (TPA) and Lingual Holding Arch (LHA).
- ☐ Make and use Nance palatal button (NPB).
- ☐ Understand the changes brought about by the application of forces and be able to use physiological force system in order to achieve orthodontic treatment goal
  - ☐ Explain mechanism of eruption of teeth.
  - ☐ Outline the Theory of equilibrium.
  - ☐ Be familiar with Metabolism of bone – basis of tooth movement.
  - ☐ Be familiar with Phases of tooth movement.
  - ☐ Describe different theories of tooth movement.
  - ☐ Explain Tissues reaction to different kinds of tooth movements.
  - ☐ Mention effects of force distribution and types of tooth movements.
  - ☐ State the effects of force duration and force decay.
  - ☐ Mention deleterious effects of orthodontic force.
  - ☐ State the outcome of Orthopaedic forces.
  - ☐ Explain effects of Drugs on tooth movement.
- ☐ Recognize the reaction produced by any applied force and plan anchorage system accurately

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- ☐ Define anchorage, state Newton's third law, and explain goals of anchorage planning.
- ☐ Enumerate and describe sources of anchorage.
- ☐ Define anchorage values of individual teeth.
- ☐ Classify anchorage.
- ☐ Appreciate significance of anchor loss.
- ☐ Explain types of anchorage planning.
- ☐ Supplement anchorage.
- ☐ Control anchorage in three planes of space.
- ☐ Explain Tweed's Anchorage preparation.
- ☐ Explain Begg's Anchorage preparation.
- ☐ Select and use mini implants as anchorage devices
- ☐ Introduce, define and discuss historical evolution of Temporary Anchorage Device (TAD).
- ☐ Enumerate indications for the use of TAD and select the patient.
- ☐ Define Criteria for ideal TAD.
- ☐ Describe advantages and failure rate of TAD.
- ☐ Describe different designs of TAD.
- ☐ Place TAD in a patient.

**8. Preventive Orthodontics:**

- ☐ Define preventive orthodontics.
- ☐ Enumerate and explain common techniques for preventive orthodontic measures.
- ☐ Explain principles and undertake the process of parent counseling.
- ☐ Explain principles, need and measure for Space maintenance.
- ☐ Explain clinical indications for deciduous teeth management on eruption and exfoliation.
- ☐ Explain and undertake treatment of treatment of locked teeth.
- ☐ Explain the clinical implications of frenal attachment in orthodontics.
- ☐ Define habit.
- ☐ Classify abnormal oral musculature and enumerate related habits.
- ☐ Explain the process of oral physiological maturation.
- ☐ Explain the process of development of habit. Explain the forms of digit sucking and its effect on the orofacial structures and its management.
- ☐ Enumerate the theories of digit sucking.
- ☐ Classify the digit sucking.
- ☐ Highlight the clinical aspect and effect of digit sucking.
- ☐ Make diagnosis and develop treatment planning.
- ☐ Define and understand the normal swallowing process and its physiology.
- ☐ Classify the tongue thrusting habit and understand the etiological factors.
- ☐ Diagnose the deviation from normality and its effect on the orofacial structures and its management.
- ☐ Define and explain the forms of mouth breathing and understand the normal physiological process of breathing.
- ☐ Mention the forms and etiological aspect of mouth breathing.
- ☐ Describe the effects of mouth breathing on the orofacial structures and its management.
- ☐ Explain the neurophysiology and causes of night grinding.
- ☐ Relate the effect of night grinding on the orofacial structures and its management.
- ☐ Explain the forms of lip habits and its effect on the orofacial structures and its management.
- ☐ Enumerate and explain other forms of abnormal habits and its effect on the orofacial structures and its management

**9. Interceptive Orthodontics:**

- ☐ Define of interceptive orthodontics.
- ☐ Enumerate and explain different types of Interceptive orthodontic measures.
- ☐ Use different methods to calculate the space required and techniques of Space regaining, Correction of cross bites, Habit elimination



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- ☐ Recognize effects of abnormal muscle activity and its prevention and interception through muscle exercises
- ☐ Removal of hard and soft tissue impediments
- ☐ Explain principles of resolution of crowding
- ☐ Describe indications and contra-indications of serial extraction
- ☐ Intercept developing malocclusion with myofunctional appliances

10. Principles of Class I Treatment:

- ☐ Introduce Class I malocclusion at different ages and the reason for treatment.
- ☐ Execute the complex non skeletal planning for the treatment of class I malocclusion during preadolescent age.
- ☐ Manage sagittal occlusal problems on Class I malocclusion during preadolescent age.
- ☐ Manage vertical occlusal problems on Class I malocclusion during preadolescent age.
- ☐ Manage transverse occlusal problems on Class I malocclusion during preadolescent age.
- ☐ Manage habits associated with Class I Malocclusion.
- ☐ Explain the general characteristics of adolescent malocclusion, advantages of adolescent treatment, and difficulties in adolescent treatment.
- ☐ Explain the clinical problems associated with adolescent Class I malocclusion.
- ☐ Develop the strategy of treatment for Class I malocclusion with different consideration.
- ☐ Apply the principles of expansion of arch dentally or skeletally with RME or SME.
- ☐ Create additional arch length.
- ☐ Plan the strategy to resolve crowding.
- ☐ Undertake the leveling of lower arch.
- ☐ Control/maintain vertical dimension to intrude upper/lower posterior teeth in vertical pattern.

11. Principles of Class II Treatment:

- ☐ Define and classify Class II malocclusion.
- ☐ Enumerate and explain the etiology, and characteristic features of Class II malocclusion.
- ☐ Explain different modalities of treatment of Class II cases
- ☐ Plan treatment for Class II cases.
- ☐ Explain the reasons for the treatment of Class II case in different age groups.
- ☐ Enumerate the limitations and predict the prognosis for Class II treatment.
- ☐ Describe the importance of the early orthodontic treatment of Class II malocclusion.
- ☐ Apply various treatment procedures for Class II.
- ☐ Implement two phase therapy.
- ☐ Explain the Class II extraction guidelines
- ☐ List indications and contraindications to implement camouflage treatment.
- ☐ Diagnose, plan and prepare patients for surgical orthodontics. *surgery*).

**Section (D) - 25 Marks**  
**Orthodontic**

12. Principles of Class III Treatment:

- ☐ Introduce Class III malocclusion and give reasons for the treatment of Class III malocclusion at different ages.
- ☐ Classify Class III malocclusion based on cephalometric classification.
- ☐ Discuss the process of treatment planning of Class III.
- ☐ Differentiate between pseudo Class III and True Class III malocclusion.
- ☐ Enumerate the indications and contraindications for early Class III treatment, and treatment for pseudo Class III malocclusion.
- ☐ Understand general strategies for Class III correction.
- ☐ Enumerate the limitations and predict the prognosis for Class III treatment
- ☐ Understand the need for early correction of anterior cross bite and early interception in Class III Cases.
- ☐ Describe the extraction protocol for Class III Cases.

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- ☐ Carry out Camouflage treatment.
- ☐ Diagnose, plan and prepare Class III patients for surgical orthodontics. to

13. Adult Orthodontics :

- ☐ Explain the evolution of adult orthodontics.
- ☐ Explain basic differences between adjunctive and comprehensive adult orthodontic treatment.
- ☐ Enumerate and explain the goals and principles of adjunctive treatment.
- ☐ Diagnose and plan treatment for adult patients.
- ☐ Perform common adjunctive procedures.
- ☐ Explain special considerations in different aspects of adult orthodontics.
- ☐ Understand the reasons for seeking comprehensive orthodontic treatment by adults.

14. Removable Appliance :

- ☐ Introduce orthodontic appliances.
- ☐ Classify orthodontic appliances.
- ☐ Explain advantages of removable appliances.
- ☐ Understand clearly the limitations of removable orthodontic appliances.
- ☐ Explain mechanical principles involved in designing orthodontic appliances.
- ☐ Explain various parts of removable appliances.
- ☐ Identify different pliers used in removable orthodontic treatment.
- ☐ Classify different types of clasps.
- ☐ Understand, design and use different types of clasps.
- ☐ Enumerate ideal requirements of a spring.
- ☐ Explain basic properties of spring.
- ☐ Understand, design and use different types of springs.
- ☐ Design and make base plate.
- ☐ Fabricate, insert and use different removable appliances.
- ☐ Describe the principles of slow expansion.

15. Principles of functional and Orthopaedic Orthodontics: Fixed Functional Appliances

- ☐ Introduce the functional appliances.
- ☐ Define and explain the evolution of functional orthodontic appliances.
- ☐ Explain the scientific concepts and validation of functional appliances.
- ☐ Explain the principles and mode of action of functional appliances.
- ☐ Apply different techniques and art of taking orthodontic impression clinically cephalometric diagnosis and functional analysis for functional appliance therapy.
- ☐ Classify and enumerate functional appliances.
- ☐ Describe Vestibular screen in detail.
- ☐ Describe Lip shields in detail.
- ☐ Describe Tongue crib in detail.
- ☐ Explain the development, action and types of activators (original and variations).
- ☐ Explain the development, action and types of Bionators (original and variations).
- ☐ Explain the development, action and types of Functional regulator or corrector.
- ☐ Combined Functional Appliances/Headgear.
- ☐ Understand the development, action and types of Twin block.
- ☐ Discuss and use fixed functional appliances.
- ☐ Explain Magnetic functional system.
- ☐ Use combined extra oral and functional appliances.
- ☐ Use maxillary retraction and intrusion splints.
- ☐ Explain Mara.
- ☐ Advocate role of functional appliances in contemporary orthodontics.

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16. Fixed Orthodontic Treatment:

- ☐ Explain Begg Philosophy.
- ☐ Discuss Edgewise appliances.
- ☐ Explain Bioprogressive Therapy.
- ☐ Explain Alexander Discipline.
- ☐ Discuss Andrews Straightwire philosophy.
- ☐ Differentiate between Roth and Andrews's prescription.
- ☐ Display proficiency in Roth philosophy and treatment mechanics.
- ☐ Display proficiency in treatment philosophy and treatment mechanics of MBT System.
- ☐ Discuss the treatment philosophy and mechanics of Tip edge Technique.
- ☐ Discuss the treatment philosophy and technique of Lingual Orthodontics.

17. Surgical Orthodontics:

- ☐ Explain need and controversies related to extraction.
- ☐ Enumerate the indications for extraction.
- ☐ Explain and execute different types of extraction procedures in orthodontics.
- ☐ Enumerate and explain the indications and contraindications for the extraction of different groups of teeth.
- ☐ Introduce the concept of growth modifications and orthognathic surgeries.
- ☐ Explain the potentials of growth modifications and orthognathic surgeries.
- ☐ Learn the limitations of growth modifications and orthognathic surgeries with respect to constitution of a patient.
- ☐ Explain the hazards and limitations of treatment combining orthodontics and orthognathic surgery.
- ☐ Introduce and enumerate indications and contraindications of Distraction Osteogenesis (DO).
- ☐ Apply Virshow law in DO.
- ☐ Discuss the different types of distracters available for Orthodontic treatment.
- ☐ Explain dentofacial deformities and facial aesthetics.
- ☐ Classify dentoskeletal deformities with respect to normal occlusion and malocclusion in three planes.
- ☐ Describe the facial esthetics.
- ☐ Enumerate the indications of orthognathic surgeries.
- ☐ Enumerate the contra-indications of orthognathic surgeries.
- ☐ List the indications of orthognathic surgeries in borderline cases.
- ☐ Undertake the procedure of clinical examination in dentofacial deformity cases.
- ☐ Undertake different diagnostic procedures in dentofacial deformity cases.
- ☐ Outline the history of first stages of development of orthognathic surgical techniques.
- ☐ Outline the history of second stages of development of orthognathic surgical techniques.
- ☐ Outline the history of third stages of development of orthognathic surgical techniques (Continuing progress).
- ☐ Explain different types of mandibular osteotomies.
- ☐ Explain different types of maxillary osteotomies.
- ☐ Enumerate indications and contraindications of orthognathic surgeries and surgical procedures in class II dentoskeletal deformities.
- ☐ Prepare Class II patients for Orthognathic surgery.
- ☐ Undertake Orthodontic preparation for the surgery.
- ☐ Enumerate types of corrective surgical procedures.
- ☐ Enumerate indications and contraindications of orthognathic surgeries and surgical procedures in class III dentoskeletal deformities.
- ☐ Prepare Class III patients for Orthognathic surgery.
- ☐ Explain different types of corrective surgical procedures.
- ☐ Classify the asymmetries. Enumerate indications and contraindications of orthognathic surgeries and surgical procedures in asymmetries.

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- ☐ Undertake Orthodontic preparation of asymmetries for the surgery.
- ☐ Enumerate and understand types of corrective surgical procedures in asymmetries.
- ☐ Classify and enumerate vertical skeletal deformities (excess and deficiency) in maxilla and mandible.
- ☐ Familiar with indications and contraindications of orthognathic surgeries and surgical procedures in vertical skeletal deformities.
- ☐ Prepare from orthodontic point of view for the surgery.
- ☐ Enumerate and understand types of corrective surgical procedures used in vertical skeletal deformities.
- ☐ Classify and enumerate transverse skeletal deformities (excess and deficiency) in maxilla and mandible.
- ☐ Understand and enumerate indications and contraindications of orthognathic surgeries and surgical procedures in vertical skeletal deformities.
- ☐ Undertake Orthodontic preparation for the surgery.
- ☐ Enumerate and understand types of corrective surgical procedures used in transverse skeletal deformities.

**18. Genetics and Orthodontics :**

- ☐ Introduce genetics, heredity and other common terminologies used in genetics.
- ☐ Explain development of Genetics.
- ☐ Describe different parts of Cell.
- ☐ Describe the structure and function of RNA and protein synthesis.
- ☐ Describe normal structure and types of chromosomes.
- ☐ Enumerate and explain chromosomal aberrations.
- ☐ Explain different types of Cell division.
- ☐ Describe structure of DNA.
- ☐ Define gene and discuss different types of genes.
- ☐ Explain role of Homeobox genes.
- ☐ Define and discuss Mutation.
- ☐ Discuss laws and modes of Inheritance.
- ☐ Explain role of Molecular genetics in oral and craniofacial dysmorphology.
- ☐ Recognize role of Heritability in malocclusion.
- ☐ Define role of Twin studies in understanding role of genetics in malocclusion.
- ☐ Discuss clinical implications of Genetics.
- ☐ Define Recent Advances in genetics.

**19. Craniofacial Anomalies (CFA) :**

- ☐ Introduce CFA. Classify and explain different causes of CFA.
- ☐ Define different terminologies used in craniofacial anomalies.
- ☐ Classify CFA.
- ☐ Use prenatal and postnatal diagnostic guidelines.
- ☐ Outline the composition of Craniofacial Team.
- ☐ Introduce craniosynostosis.
- ☐ Classify and explain clinical features of different craniosynostosis.
- ☐ Explain modalities of treatment of craniofacial anomalies.
- ☐ Introduce facial clefts.
- ☐ Classify facial clefts.
- ☐ Define, diagnose and develop treatment planning for different types of facial clefts.

**20. Cleft lip and Palate (CLP) and the role of Orthodontist:**

- ☐ Introduce CLP.
- ☐ Explain how CLP develops.
- ☐ Explain factors involved in development of CLP.

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- ☐ Explain Genetic risk and perform genetic counseling.
- ☐ Classify CLP.
- ☐ Explain the problems of CLP patients.
- ☐ Explain the Features of CLP.
- ☐ Diagnose CLP cases involving different specialties.
- ☐ Fulfill the role of orthodontist as a member of CLP team.
- ☐ Carry out Orthodontic Treatment of CLP patient as well as prepare for surgical management of CLP patients.
- ☐ Discuss speech defects in CLP patients and manage them with the help of related service providers i.e.
  - ☐ Discuss milestones of Speech and Language development.
  - ☐ Discuss acquisition of Speech sounds.
  - ☐ Describe normal Velopharyngeal (VP) function.
  - ☐ Describe Velopharyngeal muscles.
  - ☐ Explain pattern of VP closures in normal speakers.
  - ☐ Discuss various VP dysfunctions.
  - ☐ Discuss perceptual evaluation of VP dysfunction.
  - ☐ Enumerate different ways of evaluating VP dysfunction.
  - ☐ Enumerate different methods of treatment of VP dysfunction.
  - ☐ Explain hearing impairment in CLP patients.
  - ☐ Discuss speech or communication problem in CLP patients.
  - ☐ Describe articulation and articulatory errors in CLP patients.
  - ☐ Explain resonance and hypernasality.
  - ☐ Discuss voice and errors associated with voice in CLP patients.
  - ☐ Explain fluency of speech.
  - ☐ Describe speech intelligibility.
  - ☐ Decide when to start speech therapy in CLP patients.

**21. Deleterious Effects of Orthodontic Treatment :**

- ☐ Define deleterious effects.
- ☐ Classify deleterious effects.
- ☐ Prevent and manage the damages occurring in crown.
- ☐ Prevent and manage the damages occurring in root.
- ☐ Prevent and manage pulp damage
- ☐ Prevent and manage periodontal damages.
- ☐ Prevent and manage damage to TMJ.
- ☐ Prevent and manage Headgear induced damage.
- ☐ Prevent and manage allergy incidence.
- ☐ Prevent and manage burns.
- ☐ Prevent bacterial endocarditis.
- ☐ Understand and manage cross infection.

**22. Retention and Relapse:**

- ☐ Introduce retention and relapse.
- ☐ Explain different schools of thought on retention.
- ☐ Enumerate and explain Riedel's Theorem.
- ☐ Enumerate and explain William's Keys to lower retention.
- ☐ Describe occlusal changes related to growth.
- ☐ Plan retention, and control and manage relapse.
- ☐ Explain Proffit's recommendation for retention.
- ☐ Classify retainers.
- ☐ Classify and deliver temporary retainers.
- ☐ Classify and deliver permanent retainers.

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- ☐ Classify and deliver active retainers.

23. Periodontal considerations in Orthodontics:

- ☐ Understand different periodontal lesions and conditions affecting the orthodontic therapy.
- ☐ Describe adjunctive role of periodontal therapy for Orthodontic treatment.