



WELCOME TO BDS BATCH-IX

SESSION 2020

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COURSE CONTENT & OBJECTIVES

BIOCHEMISTRY

Cell

Carbohydrate

Lipid

Protein

Enzymes

Neuro-proteins

Hemoglobin

Vitamins & Minerals

Metabolism

Nutrition, Endocrinology & Metabolism

COURSE TOPIC: BIOCHEMISTRY OF CELL

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Introduction to Biochemistry	Discuss importance of Biochemistry in Dentistry	Lecture
1A	Introduction of Lab Safety procedures and equipment.	To be aware with: Lab safety procedures. Principle and operating procedures of lab equipment.	Practical
2	Cell- Biochemical Composition & Cell Organelles.	Describe the important micro and macro molecules found in the cell Discuss the major functions of organelles.	Lecture
3	Cell Membrane	Explain the Biochemical structure and functions of cell membrane	Lecture
4	Water	Explain the biochemical structure and properties of water	Lecture
4B	Preparation of Solutions	Define solution, its types. Preparation of solutions of different concentrations	Practical
5	pH & Buffers	Define the following - Buffers - Acidosis - Alkalosis Explain the types and mechanisms of action of the following: - Buffers - Acidosis - Alkalosis	Lecture & Tutorial

COURSE TOPIC: 2. CARBOHYDRATE CHEMISTRY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Introduction of Carbohydrates	Define and classify carbohydrates Discuss sources and biomedical importance of carbohydrates	Lecture & Tutorial
2	Monosaccharides Disaccharides and Oligo saccharides	Define and classify the following - Monosaccharides - Disaccharides - Oligosaccharides Describe isomerism in	Lecture & Tutorial

		monosaccharides Explain the biomedical importance of the following <ul style="list-style-type: none"> - Monosaccharides - Disaccharides - Oligosaccharides 	
2A	Detection of CHO (Scheme)	Define principle and procedure for CHO detection methods. Identify and differentiate sugars- non-sugars, reducing-non reducing sugars and monosaccharide-polysaccharides in any sample/solution.	Practical
3	Polysaccharides	Define and classify Polysaccharides Explain functions of different types of polysaccharides	Lecture & Tutorial

COURSE TOPIC: LIPID CHEMISTRY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Introduction of Lipids & Lipid Peroxidation	Define and classify lipids Discuss the functions of lipids and biomedical importance of lipids	Lecture & Tutorial
1A	Emulsification Test	Define hydrophobic nature of fats. To identify hydrophobic and hydrophilic solutions.	Practical
2	Fatty Acids & Eicosanoids & Derived Lipids	Define and classify fatty acids Explain the properties, functions and nutritional importance of fatty acids	Lecture & Tutorial
3	Compound Lipids & Cholesterol	Classify the functions and biomedical properties of each type of lipid (PL, LP, GL, sphingolipid) Discuss the functions and biomedical importance of each type of lipid	Lecture & Tutorial

COURSE TOPIC: PROTEIN CHEMISTRY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Amino Acids	Describe the properties, functions and chemical reactions of amino acids	Lecture & Tutorial
1A	Techniques for identification and separation of Amino Acids (Chromatography, Centrifugation, Salting out.)	- Define Polar and non-polar amino acids - Describe the principle and procedure for techniques used for identification of amino acids.	Practical
2	Introduction of Protein, Protein Structure & Collagen & Elastin	Explain the structure, function & biomedical importance of proteins	Lecture & Tutorial
2B	Detection of Protein (Scheme)	To detect the protein in any sample/solution.	Practical
3	Plasma Proteins & Immunoglobulins	Define and classify simple proteins (plasma proteins) Discuss biomedical importance of simple proteins	Lecture
3C	Separation of Proteins (Electrophoresis)	- To describe Ionic character of proteins. - Define principle and procedure of electrophoresis	Practical
4	Extra Cellular Matrix	Disorders CHO & Proteins	Lecture & Tutorial

COURSE TOPIC: ENZYMES

S. No	Lecture Topic	Topic Objectives	Teaching Learning
1	Introduction of Enzymes & Mechanism of Action of	Define and classify enzymes Explain the structure of	Lecture & Tutorial

	Enzymes	enzymes Discuss the mechanism of action of enzymes Describe the MM equation	
1A	Effect of Temperature and pH on enzyme action	- Define Enzyme activity. - Discuss effect of temperature and pH on enzyme activity.	Practical
2	Factors & Inhibitors	Discuss the factors that regulate enzyme activity	Lecture & Tutorial
3	Clinical Enzymology	Discuss the clinical importance of enzymes in diagnosis	Lecture

COURSE TOPIC: HEMOGLOBIN CHEMISTRY

S, No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Heme-Structure	Discuss structure, functions, & types of hemoglobin	
2	Heme-Synthesis & Porphyrins	Explain heme synthesis Discuss disorders of heme synthesis	
3	Hemoglobinopathies	Discuss the types, biochemical defects & clinical manifestation of hemolytic anemia (Thalassemia, Sickle cell Anemia.)	
4	Heme- Degradation & Jaundice	Discuss synthesis, types and fate of bilirubin Classify: - Jaundice - LFTs	
4A	Detection of Bile salt & Bile pigments	To detect the bile salts and bile pigments in given solution.	Practical
4B	Interpretation of LFT	- Define Principle and procedures for estimation of liver enzymes. Normal and abnormal values of liver enzymes. - Discuss the abnormalities of bile pigments and liver enzyme in relation to jaundice & other abnormalities.	Practical

COURSE TOPIC: VITAMINS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Vitamin A, E & K	Introduction & Classification , Discuss the structure, functions, RDA, sources and deficiency Manifestations of the following: <ul style="list-style-type: none"> - Vitamin A, E and K - Vitamin D - Vitamin C - Vitamin B12 and folic acids - Vitamin B1, B2, B3 and B6 	
2	Vitamin D		
3	Vitamin C		
4	Vitamin B12 & Folic Acids		
5	Vitamin B1, B2, B3 & B6		

COURSE TOPIC: MINERALS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Iron	Discuss the functions, RDA, sources, transport, storage, biochemical role & clinical importance of: <ul style="list-style-type: none"> - Sodium - Chloride - Iron - Calcium - Phosphorous - Fluoride - Other minerals. 	
2	Calcium, Phosphorus		
3	Fluoride & Other Minerals		
3A	Detection of Abnormal Urine	Enlist the abnormal contents of urine. To correlate the abnormal constituents of urine with the clinical condition.	Practical

MID TERM EXAMINATION**COURSE TOPIC: Genetics**

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Nucleotides	Define nucleoproteins Discuss the chemical structure & significance of nucleoproteins	Lecture

2	DNA & RNA	Describe the chemical structure, properties and functions of DNA & RNA	Lecture & Tutorial
3	Central Dogma of Molecular Biology	Discuss the central dogma of molecular biology	Lecture
4	DNA Replication		Lecture & Tutorial
5	Nucleic Acid	Metabolism Brief Missing	Lecture & Tutorial
6	Transcription & Post transcriptional modification	Describe the steps of transcription and its enzymes	Lecture & Tutorial
6A	Determination of Uric Acid	Define Normal value of uric acid. To correlate the abnormal value of uric acid with the disease.	Practical
7	Translation & Post transcriptional modification	Describe the steps of translation and its enzymes	
	Detection of Normal Urine	Describe the chemical composition of normal urine.	Practical
8	Protein synthesis and gene expression	Describe protein synthesis Discuss the role of protein	

COURSE TOPIC: CARBOHYDRATE METABOLISM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Digestion & Absorption of Carbohydrates	Describe the breakdown of complex dietary carbohydrates to simple sugars Discuss the absorption of simple sugars from GIT into portal blood	Lecture
2	Glycolysis	Define glycolysis Explain the reactions involved in glycolytic pathway	Lecture & Tutorial

		Discuss the fate of pyruvate formed from glucose	
3	TCA	Explain the reactions & the regulation of citric acid cycle.	Lecture & Tutorial
4	Gluconeogenesis	Define gluconeogenesis. Discuss the process of gluconeogenesis.	Lecture & Tutorial
5	Glycogen Metabolism	Describe the formation, break down and regulation of glycogen	Lecture & Tutorial
6	HMP	Describe purpose, importance & reactions of Hexose Monophosphate Pathway	Lecture & Tutorial
7	Regulation of Blood Glucose & Diabetes Mellitus	State the range of normal blood glucose level. Discuss the clinical significance of variations in blood glucose level and metabolic derangements that occur in Diabetes Mellitus.	Lecture & Tutorial

COURSE TOPIC: LIPID METABOLISM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Digestion & Absorption of Lipids	Describe the breakdown of complex dietary lipids into simpler forms. Discuss the absorption of simpler forms of dietary lipids from GIT.	Lecture & Tutorial
2	Cholesterol & Lipid Transport (Lipoproteins)	Discuss the chemistry, metabolism and associated clinical disorders of lipoproteins.	Lecture & Tutorial
3	β Oxidation	Explain the oxidation of fatty acid	Lecture & Tutorial
4	Ketone Bodies	Explain the synthesis & utilization of Ketone Bodies	Lecture & Tutorial

COURSE TOPIC: ELECTRON TRANSPORT CHAIN

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Electron Transport Chain	Discuss the structure & functions of Electron Transport Chain Describe the synthesis of ATP	Lecture & Tutorial

COURSE TOPIC: PROTEIN METABOLISM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Learning
1	Digestion & Absorption of Proteins	Describe the breakdown of dietary proteins into simpler forms Discuss the absorption of simpler forms of dietary proteins from GIT	Lecture & Tutorial
2	Reactions of Amino acids & Urea Cycle and NH ₃ Toxicity	Explain the reactions of amino acids Describe the ammonia metabolism	Lecture & Tutorial
3	Phenylalanine, Tyrosine & Tryptophan Metabolism	Discuss the metabolism and inborn errors of specific amino acids	Tutorial

COURSE TOPIC: ENDOCRINOLOGY

S. No	Lecture Topic	Topic Objectives	Teaching Learning
1	Introduction of Hormones	Define hormones Classify hormones	Lecture & Tutorial
2	Hypothalamus, Pituitary & Thyroid	Discuss the general characteristic of different types of hormones	Lecture & Tutorial
3	Adrenal & Pancreatic Hormones	Explain the chemistry, mechanism of action & metabolic role of hormones released by the following structures <ul style="list-style-type: none">- Hypothalamus- Pituitary gland- Thyroid gland- Adrenal glands- Pancreas	Lecture & Tutorial

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COURSE CONTENT & OBJECTIVES

ORAL BIOLOGY

Introduction to structures

Embryology of head, face and oral cavity

Cytoskeleton

Development of tooth

Bone

Enamel

Dentin-pulp complex

Periodontium

Physiologic tooth movement

Salivary glands

Oral mucosa

Temporo-mandibular joints

Repair and regeneration

Dental anatomy

Occlusion

Forensic dental anatomy

COURSE TOPIC: INTRODUCTION TO STRUCTURES OF ORAL TISSUES

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction to oral biology & structure of tooth	Discuss the clinical application of oral biology List all structures of a tooth Identify structures of a tooth on models.
2	Introduction to supporting structure of tooth	Identify the supporting structures of a tooth on pictures/ models. Differentiate among the various supporting structures of a tooth
3	Age changes & clinical relevance of the structure of tooth 1	Discuss the clinical relevance of the following structures <ul style="list-style-type: none"> - Enamel - Dentine - Cementum - Periodontal ligament Discuss age-related changes of the following structures <ul style="list-style-type: none"> - Enamel - Dentine - Cementum - Periodontal ligament

COURSE TOPIC: GENERAL EMBRYOLOGY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Germ cell Formation and Fertilization, Prenatal Development	Discuss germ cell formation, fertilization and prenatal development. Describe Induction, Competence, and Differentiation.
2	Formation of Embryo, Neural Tube and Fate of Germ Layers	Discuss: <ul style="list-style-type: none"> - Development of three-layered embryo - Development of neural tube - Fate of germ layer

COURSE TOPIC: EMBRYOLOGY OF HEAD FACE AND ORAL CAVITY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Neural Crest Cells and Head Formation, Branchial (Pharyngeal) Arches and Primitive Mouth	List the: <ul style="list-style-type: none"> - Derivatives of Pharyngeal Arches - Derivatives of pharyngeal pouches - Types of teratogens
2	Formation of Face and Secondary Palate	Explain the development of the following structures of the embryo <ul style="list-style-type: none"> - Head - Face - Palate - Tongue - Skull - Maxilla - Mandible - Temporomandibular joint
3	Formation of Tongue	
4	Development of Skull	
5	Development of Mandible and Maxilla	
6	Development of Temporomandibular Joint	

7	Congenital Defects	Differentiate between the following processes <ul style="list-style-type: none"> - Intramembranous and cartilaginous ossification - Development of maxilla and mandible Discuss the various types of clefts of lip and palate
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COURSE TOPIC: CYTOSKELETON, CELL JUNCTIONS, FIBROBLASTS, AND EXTRACELLULAR MATRIX

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Cytoskeleton, Intercellular junctions, Epithelium–connective tissue interface	Define the cytoskeleton Differentiate among the types of the following structures of cytoskeleton <ul style="list-style-type: none"> - Filaments - Intercellular junctions
2	Fibroblasts, Secretory Products of Fibroblasts	Discuss fibroblasts

COURSE TOPIC: DEVELOPMENT OF THE TOOTH AND ITS SUPPORTING TISSUES

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Stages of tooth development	Discuss the development of: <ul style="list-style-type: none"> - Primary epithelial band - Dental lamina - Vestibular lamina - Hard tissues of tooth - Root Differentiate among/between the following <ul style="list-style-type: none"> - All stages of tooth development - Single and multi-rooted tooth development Discuss the theories of tooth type determination
2	Tooth Type Determination	
3	Hard Tissue Formation & Root Formation	

COURSE TOPIC: BONE

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Gross Bone Histology & bone cells	Discuss the composition, histology of bone Describe the structure and functions of bone cells
2	Development of bone	Differentiate between endochondral & intramembranous bone formation Discuss the histology of endochondral & intramembranous bone

COURSE TOPIC: ENAMEL: COMPOSITION, FORMATION, AND STRUCTURE

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction to enamel	Describe the composition, physical properties and histological features of enamel.
2	Stages of Amelogenesis & Mineralization	
3	Structural, Organizational Features Of Enamel	Differentiate among the stages of Amelogenesis. Identify the histological features of enamel .

COURSE TOPIC: DENTIN-PULP COMPLEX

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction, types, dentine formation	Describe the composition, formation and histological landmarks of dentine of Discuss the cells of dental pulp
2	Histology Of Dentin	Critically analyze theories of dentine sensitivity
3	Pulp & cells of dental pulp	Identify the following on models/ pictures:
4	Theories of Dentin Sensitivity	<ul style="list-style-type: none"> - Various types of dentine, - Histological landmarks of dentine, - Zones of dental pulp.

COURSE TOPIC: PERIODONTIUM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction to periodontium.	Define periodontium. List the components of periodontium.
2	Cementum formation & Types of cementum	Classify cementum. Discuss the formation and biochemical composition of cementum.
3	Alveolar bone	Describe the structure of alveolar bone. Identify the histological features of alveolar bone on pictures.
4	Periodontal Ligaments	Classify the periodontal ligaments. Discuss the cells of periodontal ligament space.

COURSE TOPIC: PHYSIOLOGIC TOOTH MOVEMENT: ERUPTION AND SHEDDING

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Preruptive & Eruptive Tooth Movement	Describe the following types of tooth movements:
2	Posteruptive & Abnormal Tooth Movement	<ul style="list-style-type: none"> - Preruptive; - Posteruptive; - Abnormal; - Orthodontic.
3	Shedding Of Teeth	Discuss shedding of teeth.

COURSE TOPIC: SALIVARY GLANDS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Anatomy, development & functions of salivary glands	Describe the anatomy of salivary glands Discuss the composition of saliva
2	Histology of Major & Minor Salivary Glands	List age-related changes in salivary glands
3	Clinical Considerations	Discuss diseases of salivary glands Relate the composition of saliva with its functions

COURSE TOPIC: ORAL MUCOSA

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Definition, Boundaries & Functions of Oral Mucosa	Define oral mucosa Describe the boundaries of oral cavity Explain the structure of oral mucosa Relate the structure of oral mucosa with its functions
2	Oral mucosa, Oral Epithelium & Lamina Propria.	Classify different types of oral mucosa Differentiate between different types of oral mucosa on the basis of histology Describe the cells of epithelium & connective tissue
3	Clinical variations & Age Changes in oral mucosa	Describe the clinical variations & age changes within the oral mucosa

COURSE TOPIC: TEMPOROMANDIBULAR JOINT

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Classification Of Joints Anatomy & histology of temporomandibular joint	Classify joints List examples of each type of joint Describe the following
2	Muscles Of Mastication & Biomechanics, Innervations & Blood Supply To TMJ	<ul style="list-style-type: none"> - Macroscopic and microscopic structure of a joint - Muscles of temporomandibular joint - Innervations and blood supply of temporomandibular joint. Relate the muscle attachments with movement of joint

COURSE TOPIC: FACIAL GROWTH AND DEVELOPMENT

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Facial Types & Profiles	Discuss various facial types & profiles Relate the facial profiles with gender & age Describe facial growth

COURSE TOPIC: REPAIR AND REGENERATION OF ORAL TISSUES

S. NO	LECTURE TOPIC	TOPIC OBJECTIVES
1	Wound Healing In Oral Mucosa	Discuss the various faces of bone healing in oral mucosa. Describe the bone healing act at dentinogingival junction.
2	Repair of tooth & supporting structures 1	Discuss the repair of enamel, dentine-pulp complex and periodontium.
3	Repair of tooth & supporting structures 2	

COURSE TOPIC: INTRODUCTION TO DENTAL ANATOMY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction to Dental Anatomy 1	Describe the following <ul style="list-style-type: none"> - Clinical application of oral biology/dental anatomy - Importance of oral biology/dental anatomy

		<ul style="list-style-type: none"> - Primary, transitional & permanent dentition periods - Tooth numbering systems - Surfaces and landmarks of teeth <p>Identify the following on models/ pictures:</p> <ul style="list-style-type: none"> - Primary, transitional & permanent dentition periods - Teeth on the basis of various tooth notation systems on models - Surfaces and landmarks of teeth On Models
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COURSE TOPIC: DEVELOPMENT AND ERUPTION OF THE TEETH

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Development And Eruption of Primary & permanent teeth	Describe the pattern & age of eruption of primary & permanent teeth Estimate the dental age of an individual

COURSE TOPIC: THE PRIMARY (DECIDUOUS) TEETH

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary Central & Lateral Incisor	Identify all deciduous teeth on models.
2	Mandibular Central & Lateral Incisor	Explain the landmarks of all deciduous teeth.
3	Maxillary & Mandibular Canine	Describe the endodontic anatomy of all deciduous teeth.
4	Maxillary First & Second Molar	
5	Mandibular First & Second Molar	

COURSE TOPIC: OROFACIAL COMPLEX: FORM AND FUNCTION

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Physiological Form Of Teeth And Periodontium	Describe the physiological form of the teeth and periodontium
2	Contact Areas, Interproximal Spaces	Describe contact areas, interproximal spaces & embrasures Identify contact areas , interproximal spaces & embrasures on models/ pictures.

COURSE TOPIC: THE PERMANENT MAXILLARY INCISORS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary Central Incisor	Identify maxillary incisors on models/ pictures.
2	Maxillary Lateral Incisors	Describe the landmarks and endodontic anatomy of maxillary incisors Compare maxillary central and lateral incisors with regard to their macroscopic structure

COURSE TOPIC: THE PERMANENT MANDIBULAR INCISORS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Mandibular Central Incisor	Identify mandibular incisors on models/ pictures.
2	Mandibular Lateral Incisor	Describe the landmarks and endodontic anatomy of these teeth Compare mandibular central and lateral incisors with regard to their macroscopic structure

COURSE TOPIC: THE PERMANENT CANINES: MAXILLARY AND MANDIBULAR

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary Canine	Identify canines on models/ pictures.
2	Mandibular Canine	Describe the landmarks and endodontic anatomy of these teeth compare maxillary and mandibular canines with regard to their macroscopic structure

COURSE TOPIC: THE PERMANENT MAXILLARY PREMOLARS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary First Premolar	Identify maxillary premolars on models/ pictures.
2	Maxillary second premolar	Describe the landmarks and endodontic anatomy of these teeth compare maxillary first and second premolars with regard to their macroscopic structure

COURSE TOPIC: THE PERMANENT MANDIBULAR PREMOLARS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Mandibular First Premolar	Identify mandibular premolars on models/ pictures.
2	Mandibular Second Premolar	Describe the landmarks and endodontic anatomy of these teeth Compare mandibular first and second premolars with regard to their macroscopic structure

COURSE TOPIC: THE PERMANENT MAXILLARY MOLARS

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Maxillary First Molar	Identify maxillary molars on models/ pictures.
2	Maxillary Second Molar	Describe the landmarks and endodontic anatomy of these teeth Compare maxillary first, second and third molars with regard to their macroscopic structure
3	Maxillary Third Molar	

COURSE TOPIC: THE PERMANENT MANDIBULAR MOLARS- FIRST, SECOND AND THIRD

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Mandibular First Molar	Identify mandibular molars on models/ pictures.
2	Mandibular Second Molar	Describe the landmarks and endodontic anatomy of these teeth

3	Mandibular Third Molar	Compare mandibular first, second and third molars with regard to their macroscopic structure
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COURSE TOPIC: DENTO-OSSEOUS STRUCTURES, BLOOD VESSELS AND NERVES

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Structure of Maxilla & Mandible	Describe the macroscopic structures of maxilla and mandible Discuss the Arterial Supply & Nerve Supply to the Jaws and Teeth
2	Arterial Supply & Nerve Supply of Jaws and Teeth	

COURSE TOPIC: OCCLUSION

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Basics of Primary Occlusion	Discuss occlusion in primary and permanent dentitions
2	Basics of Permanent Occlusion	

COURSE TOPIC: FORENSICS DENTAL ANATOMY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES
1	Introduction & application of Forensic Dentistry	Define forensic dentistry Describe the methods of identification of unidentified individuals Discuss application of forensic dentistry

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COURSE CONTENT & OBJECTIVES

ANATOMY

General anatomy & Histology

General Embryology

Head & Neck

Neuroanatomy

Abdomen & Thorax

COURSE TOPIC: GENERAL ANATOMY AND HISTOLOGY

S. No	LECTURE TOPICS	TOPIC OBJECTIVES	TEACHING STRATEGIES	ASSESSMENT
1	Introduction to Anatomy	Define anatomy. Compare the branches of anatomy with regard to their practical implications.	Lecture	BCQS
2	Terms of position and movements	Describe the location and movement of different parts of body with respect to various terms of position and movement.	Tutorial	bcqs
3	Cell	Describe cell and cell organelles. Discuss functions of cells. Discuss cell cycle.	Lecture/practical I	bcqs/ospe
4	Epithelial Tissue	Compare different types of epithelia with regard to their features, functions and locations.	Lecture/practical	bcqs/ospe
5	Connective Tissue	Classify the following with regard to their structures, functions and locations: - Connective tissue; - Components of connective tissue.	Lecture/practical	bcqs/ospe
6	Bones	Compare various types of bone with regard to their development, shape, histological features and blood supply.	Tutorial	bcqs
7	Cartilages	Classify cartilages with regard to their location, morphology, histology and function.	Lecture/practical	bcqs/ospe
8	Joints of Body	Relate the following: - Structure of different types of joint with their movements - General features of synovial joints with their locations	Tutorial/lecture	bcqs/ospe
9	Muscle	Classify muscles according to their macroscopic and microscopic structures and functions	Lecture/tutorial	bcqs
10	Introduction to Limbs	Describe general arrangement of bones and muscles	tutorial	
11	Development of Musculoskeletal system	Discuss musculoskeletal system development	Lecture	bcqs
12	General organization of CVS	Discuss the organization of circulatory system	Lecture	bcqs
13	Histology of blood vessels	Compare the types of blood vessels with regard to their histology.	Lecture/practical	bcqs/ospe
14	Microscopy and types of microscope	Demonstrate operational steps of microscope handling	practical	
15	Lymphatic system	Discuss the immune system.	Tutorial	bcqs

16	Lymphoid tissue	Compare the lymphoid organs with regard to their histology and function	Lecture/practical	bcqs
17	Skin and Fascia	Discuss the structure and distribution of skin and fascia	Lecture	bcqs
18	Histology of skin	Discuss the Gross & histological features of skin and its appendages.	Lecture/practical	bcqs

COURSE TOPIC: GENERAL EMBRYOLOGY

S. No	LECTURE TOPICS	TOPIC OBJECTIVES		
1	Introduction to Embryology	Define Embryology and Embryological terms Discuss the clinical application of embryology	Lecture	bcqs
2	Reproductive system	Identify parts of male and female reproductive system and their functions.	tutorial	
3	Uterine Cycle		tutorial	
4	Cell division & Cell Cycle	Discuss types of cell division and their clinical importance.	Lecture	bcqs
5	Meiosis & Gametogenesis	Correlate the processes of meiosis and gametogenesis.	Lecture	bcqs
6	Fertilization and Implantation	Discuss the processes of fertilization & implantation. Discuss the following:	Lecture	bcqs/ospe
7	Development up to 3 weeks	Development of fetus	Lecture	bcqs/ospe
8	Embryonic Period	Events occur during each week	Lecture	bcqs/ospe
9	Fetal Period	Derivatives of ectoderm,mesoderm and endoderm	Lecture	bcqs/ospe
10	Fetal membranes and Placenta	Role of teratogens in congenital anomalies Importance of antenatal diagnostic techniques	Lecture	bcqs/ospe
11	Role of Genes & Teratogens in birth defects		Lecture	bcqs
12	Antenatal diagnostic techniques		Lecture	bcqs

COURSE TOPIC: HEAD AND NECK

S. NO	LECTURE TOPICS	TOPIC OBJECTIVES	TEACHING STRATEGIES	ASSESEMENT
1	Introduction of head and neck structures	Discuss the clinical relevance of the structures of skull as seen on 4 normas.	tutorial	Ospe/bcqs
2	The 4 Normas of skull	Relate the features of different aspects of skull with their clinical relevance.	tutorial	Ospe/bcqs
3	Osteology of mandible	Identify the structures associated with mandible on models.	tutorial	ospe
4	The scalp	Discuss the clinical importance of the structures of scalp.	lecture	Ospe/bcqs
5	Face	Discuss the blood supply, nerve supply, lymphatic drainage and clinical conditions associated with muscles of facial expression.	lecture	Ospe/bcqs
6	Development of Face	Describe development and anomalies of face and pharyngeal apparatus.	lecture	Ospe/bcqs
7	Pharyngeal arches	Discuss gross anatomy of orbit, eye and its contents.	lecture	Ospe/bcqs
8	Orbital boundaries and contents	List the derivatives of optic cup. Discuss development of the eye.	Lecture/tutuorial	Ospe/bcqs
9	Gross anatomy of eye ball		Lecture/tutorial	bcqs
10	Development of Eye		lecture	bcqs
11	External, middle, Internal ear	Discuss the clinical importance of the macroscopic structures of ear	Lecture/tutorial	bcqs

12	Development of Ear	List the derivatives of otic vesicle.	lecture	bcqs
13	Temporal fossa	Identify the structures of temporal and infra temporal region based on data provided.	Lecture/tutorial	Ospe/bcqs
14	Infratemporal fossa		Lecture/tutorial	Ospe/bcqs
15	TMJ & Muscles of mastication	Discuss the articulation, neurovascular supply and the muscles of Temporomandibular joint	Lecture/tutorial	Ospe/bcqs
16	Nose & Paranasal sinuses	Discuss macroscopic and microscopic structures of nose and paranasal sinuses and their clinical application	Lecture/tutorial	Ospe/bcqs
17	Nose & Paranasal sinuses	Describe development of nose and paranasal sinuses	Lecture/tutorial	Ospe/bcqs
18	Oral cavity	Discuss the gross anatomy of oral cavity	Lecture/tutorial	Ospe/bcqs
19	Oral cavity	Differentiate among the microscopic features of contents of oral cavity	Lecture/tutorial	Ospe/bcqs
20	Tongue	Describe the macroscopic and microscopic features of tongue	Lecture/tutorial	Ospe/bcqs
21	Tongue & Palate	Discuss development of oral structures Discuss common anomalies of oral structures	Lecture/tutorial	Ospe/bcqs
22	Development of Teeth		Lecture/tutorial	Ospe/bcqs
23	Major salivary glands	Discuss macroscopic structures of major salivary glands and their clinical importance	Lecture/tutorial	Ospe/bcqs
24	Salivary glands	Relate the histological differentiation of salivary glands with their function.	Lecture/tutorial	Ospe/bcqs
25	Major salivary glands	Discuss development of major salivary glands	Lecture/tutorial	Ospe/bcqs
26	Cervical vertebra	Identify the cervical vertebrae based on data provided. Discuss the importance of cervical vertebrae as land marks	Lecture/tutorial	Ospe/bcqs
27	Skin, Fascia & neck muscles	Identify the macroscopic structures of the neck based on data provided.	Lecture/tutorial	Ospe/bcqs

28	Triangles of neck	Describe the boundaries of the triangles of neck and their contents	Lecture/tutorial	Ospe/bcqs
29	Pituitary & Pineal gland	Describe the macroscopic and microscopic structures and development of pituitary and pineal glands.	Lecture/tutorial	Ospe/bcqs
30	Thyroid & Parathyroid glands	Discuss gross anatomy and clinical importance of thyroid and parathyroid glands	Lecture/tutorial	Ospe/bcqs
31	Development of Thyroid & Parathyroid glands	Discuss development and anomalies of thyroid and parathyroid gland	Lecture/tutorial	Ospe/bcqs
32	Pituitary gland	Describe the dual origin of pituitary gland	Lecture/tutorial	Ospe/bcqs
33	Pharynx	Describe the division of pharynx	Lecture/tutorial	Ospe/bcqs
34	Larynx	Discuss the macroscopic and microscopic structures of the larynx	Lecture/tutorial	Ospe/bcqs
35	Trachea	Discuss the macroscopic and microscopic structures of trachea	Lecture/tutorial	Ospe/bcqs
36	Cranial nerves 5,7,9,10&12	Describe the course of cranial nerves and effects of their injury	Lecture/tutorial	Ospe/bcqs
37	Major Vessels of neck	Identify major arteries and their main branches in neck on models and normal subjects.	Lecture/tutorial	Ospe/bcqs
38	Head & neck	Discuss lymphatic drainage of head and neck.	Lecture/tutorial	Ospe/bcqs

S. No	LECTURE TOPICS	TOPIC OBJECTIVES	
1	Cranial fossae	Describe features of cranial cavity.	Lecture/tutorial ospe/bcqs
2	Development of nervous system	List the steps of development of central nervous system.	Lecture/tutorial ospe/bcqs
3	Blood supply of brain and spinal cord	Discuss the clinical importance of blood supply of brain and spinal cord.	Lecture/tutorial ospe/bcqs
4	Meninges of the brain and spinal cord	Discuss the clinical importance of meninges of brain and spinal cord with regard to the following spaces: <ul style="list-style-type: none"> - Epidural, - Subdural, - Subarachnoid. 	Lecture/tutorial ospe/bcqs
5	Dural venous sinuses	Describe the location and communications of dural venous sinuses.	Lecture/tutorial ospe/bcqs

		Discuss the clinical significance of dural venous sinuses.	
6	Ventricular system of brain	Describe the structure of ventricular system. Correlate the structure of ventricular system with CSF disorders.	Lecture/tutorial ospe/bcqs
7	Brain stem	Describe the external features and attachment of cranial nerves with lesions.	Lecture/tutorial ospe/bcqs
8	Cerebellum	List the deep cerebellar nuclei.	Lecture/tutorial ospe/bcqs
9	Diencephalon	Describe the macroscopic features of the following structures: <ul style="list-style-type: none"> - Cerebellum - Diencephalon - Thalamus Describe the general distribution of white matter. Identify the following based on pictures/ models: <ul style="list-style-type: none"> - Functional cortical areas - Cranial nerve nuclei and their functional components - Brain and spinal cord (on radiographs). Describe the structural and functional organization of autonomic nervous system.	Lecture/tutorial ospe/bcqs
10	Cerebrum		Lecture/tutorial ospe/bcqs
11	Cranial nerves I-XII		Lecture/tutorial ospe/bcqs
12	Autonomic nervous system		Lecture/tutorial ospe/bcqs
13	Imaging of Brain and spinal cord		Lecture/tutorial ospe/bcqs

COURSE TOPIC: NEUROANATOMY

TOPIC: ABDOMEN AND THORAX

S. NO	LECTURE TOPICS	TOPIC OBJECTIVES		
1	Introduction to	Describe the boundaries of thoracic	Lecture/tutorial	bcqs

	thoracic cavity	cavity and its contents		
2	Mediastinum	Describe the boundaries and contents of mediastinum.	Lecture/tutorial	bcqs
3	Gross and histology of thoracic part of respiratory tract	Identify the macroscopic and microscopic structures of lung based on data provided.	Lecture/tutorial	Ospe/bcqs
4	Development of respiratory system	List derivatives of lung bud	Lecture/practical	Ospe/bcqs
5	Overview of Pericardium and Heart	Describe the macroscopic structures of heart and pericardium	Lecture/tutorial	bcqs
6	Development of CVS	List parts of primitives of heart tube & their derivatives	Lecture	bcqs
7	General Histological features of GIT	Differentiate among the parts of small & large intestine on the basis of histology	Lecture/practical	bcqs
8	Development of GIT	List the derivatives of foregut, midgut & hindgut	Lecture/	bcqs
9	introduction of abdomen	quadrants, regions and the introduction of oesophagus, stomach, small and large intestine, pancreas, liver and spleen	Lecture/tutorial	bcqs

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COURSE CONTENT & OBJECTIVES

PHYSIOLOGY

Basic Physiology

Blood

Nerve & Muscle

Cardiovascular

Respiratory

Neuroscience

Special senses & Endocrinology

Digestive and Urinary

COURSE TOPIC: BASIC PHYSIOLOGY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES	Teaching Method	Assessment Method	Comments
1.	Introduction of Physiology & Homeostasis	Discuss: <ul style="list-style-type: none"> - What is Physiology? - Importance of Physiology in modern medicine. - Basic life processes and survival needs of the body. - Principle of homeostasis as a central theme of Physiology. - Negative and positive feedback systems. 	Lecture Tutorial	BCQs Viva SAQs	
2.	Body fluid compartments	Describe the body fluid compartments. Discuss the composition of body fluid compartments.	Lecture Tutorial	BCQs Viva SAQs	
3.	Cell membrane	Define cell. Discuss the importance of cell as the basic unit of life. Describe the composition of cell membrane.	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
4.	Cell organelle 1	Discuss the structure and functions of all components of a cell.	Lecture Tutorial	BCQs Viva SAQs	
5.	Membrane transport 1	Discuss the types of membrane transport. Define Passive transport Define the following: <ul style="list-style-type: none"> - osmotic pressure - tonicity - bulk transport - phagocytosis - pinocytosis Compare types of solutions with regard to their tonicity.	Lecture Tutorial	BCQs Viva SAQs	
6.	Membrane transport 2	Discuss Active transport Types of Active transport <ul style="list-style-type: none"> - Primary active transport - Secondary active transport 	Lecture Tutorial	BCQs Viva SAQs	

COURSE TOPIC: BLOOD

S. No	LECTURE TOPIC	TOPIC OBJECTIVES			
1.	Composition of blood	Describe the components of blood and their functions. Describe the functions of blood.	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
2.	Erythropoiesis & Factors affecting erythropoiesis	Describe the structure and functions of erythrocytes. Draw a flow chart of RBCs production. Enumerate the sites of erythropoiesis. Discuss the humoral, maturation & nutritional factors affecting erythropoiesis.	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
3.	Hemoglobin- Anemia & Polycythemia	Discuss the formation, functions, fate and pathologies of hemoglobin. Define the following: - Anemia - Polycythemia. Classify anemia on the basis of - Morphology. - Etiology. Discuss various types of polycythemia.	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
4.	Blood groups	Discuss the following: - ABO blood types. - Rh blood types. - Mismatched blood transfusion hazards. - Erythroblastosis fetalis.	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
5.	Hemostasis 1	Define hemostasis. Discuss the events of hemostasis. List the contents and functions of platelets. Discuss the following - Intrinsic and extrinsic coagulation pathways	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	

6.	Hemostasis 2	Balance between bleeding and coagulation Fibrinolytic mechanism Factors that prevent clotting in normal vascular system Conditions that cause excessive bleeding in human beings	Lecture Tutorial	BCQs Viva SAQs Practical Exam	
7.	White blood cells	Discuss leukopoeisis and inflammation Differentiate among the types of white blood cells on the basis of their function and physical characteristics	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
8.	Immunity- Antigen, antibody structure	Describe immunity and its types - Innate (non-adaptive) - Acquired (adaptive) Discuss types and functions of lymphocytes	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
9.	Humoral immunity &	Discuss the structure and mechanism of action of antigen and antibody Describe the complement system.	Lecture Tutorial	BCQs Viva SAQs	
10.	Cell mediated immunity	Discuss Cell mediated immunity Types of T cells Coordinated working of Humoral and cell mediated immunity Describe allergy and hypersensitivity reactions.	Lecture Tutorial	BCQs Viva SAQs	

COURSE TOPIC: Nerve and Muscle

S. No	LECTURE TOPIC	TOPIC OBJECTIVES			
1.	Resting membrane potential	Discuss: - Distribution of ions across the plasma - Resting potential and its importance	Lecture Tutorial	BCQs Viva SAQs	

		Define Nernst potential. Write the Nernst equation.			
2.	Structure of neuron & synapse	Describe the structure and function of different parts of neuron. Define synapse. Discuss the following types of synapse <ul style="list-style-type: none"> - Electrical synapse - Chemical synapse 	Lecture Tutorial	BCQs Viva SAQs	
3.	Graded potential- Action potential- Properties & propagation	Discuss graded potential Discuss the action potential, its propagation in myelinated and non-myelinated nerve fibers. Describe the graph of action potential. Differentiate between graded and action potentials.	Lecture Tutorial	BCQs Viva SAQs	
4.	Structure of skeletal muscle	Describe muscle tissue and its functions. Discuss organizational levels of skeletal muscle.	Lecture Tutorial	BCQs Viva SAQs	
5.	Neuromuscular junction	Discuss the parts of neuromuscular junction (NMJ). Discuss the steps of impulse transmission through neuromuscular junction. Discuss the physiological basis of disorders of NMJ.	Lecture Tutorial	BCQs Viva SAQs	
6.	Excitation contraction coupling & Mechanism of Skeletal muscle contraction	Discuss mechanism of muscle contraction in the skeletal muscle. Describe structure and function of sarcoplasmic reticulum and T-tubules. Define power stroke. Describe the role of ATP in muscle contraction. Define: <ul style="list-style-type: none"> - motor unit - motor unit recruitment - simple muscle twitch - summation - tetanization 	Lecture Tutorial	BCQs Viva SAQs	

		- fatigue Differentiate between isotonic and isometric muscle contraction.			
7.	Smooth muscle	List the types of smooth muscles. Discuss the following: <ul style="list-style-type: none"> • Membrane & action potentials in smooth muscles. • Contractile mechanism of smooth muscles. • Nervous and hormonal control of smooth muscle contraction. 	Lecture Tutorial	BCQs Viva SAQs	
8.	Skeletal, Smooth & Cardiac muscle Comparison	Compare smooth, cardiac and skeletal muscles with regard to their structure and function.	Tutorial Lecture	BCQs Viva SAQs	

COURSE TOPIC: CARDIOVASCULAR SYSTEM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES			
1.	Structure of heart & Cardiac muscle	Discuss the physiology of cardiac muscle and the importance of intercalated discs in cardiac muscle function. Compare types of muscles with regard to their structure and functions. Correlate the structure of cardiac muscle to its function.	Lecture Tutorial	BCQs Viva SAQs	
2.	Cardiac action	Discuss the cardiac action	Lecture	BCQs	

	potential Conduction system of heart	potential. Compare the skeletal muscle and heart with regard to their action potentials. Discuss the electrical conduction system of heart and components Discuss role of SA node in conduction system of heart.	Tutorial	Viva SAQs	
3.	Basic Electrocardiography 1	Draw electrocardiogram (ECG) of a normally functioning heart Discuss the following: <ul style="list-style-type: none"> - Myocardial events - 12 ECG leads - Tachycardia - Bradycardia - 	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
4.	Basic Electrocardiography 2	Define the Cardiac vector and axis of heart Discuss <ul style="list-style-type: none"> - Myocardial infarction/ischemia - Atrial flutter - Atrial fibrillation - Heart blocks 	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
5.	Cardiac cycle / Heart sounds	Discuss the cardiac cycle Different phases of cardiac cycle Heart Sound in relation to phases of cardiac cycle	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
6.	Cardiac output Factors affecting cardiac output	Discuss the following <ul style="list-style-type: none"> - Cardiac output - Frank-Starling law - Nervous and chemical factors that alter heart rate, stroke volume, and cardiac output 	Lecture Tutorial	BCQs Viva SAQs BCQs Viva SAQs	
7.	Hemodynamics	Discuss the physical characteristics of circulation Discuss the interrelationships of pressure, blood flow and resistance Discuss vascular distensibility and functions of the arterial and	Lecture Tutorial	BCQs Viva SAQs	

		venous systems			
8.	Blood pressure & its regulation 1	<p>Define:</p> <ul style="list-style-type: none"> - Systolic blood pressure - Diastolic blood pressure - Mean arterial blood pressure - Pulse pressure <p>Discuss short term and intermediate regulations of blood pressure.</p>	<p>Lecture</p> <p>Tutorial</p> <p>Practical</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p> <p>Practical Exam</p>	
9.	Blood pressure & its regulation 2	<p>Discuss long-term regulations of blood pressure.</p> <p>Describe the renin angiotensin aldosterone system</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p> <p>Practical Exam</p>	
10.	Local control of blood flow & Microcirculation	<p>Discuss the following</p> <ul style="list-style-type: none"> - Local control of blood flow - Humoral control of circulation <p>Discuss the capillary system, vasomotion and fluid-filtration across capillaries</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
11.	Circulatory Shock	Discuss the physiological causes of shock	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	

COURSE TOPIC: RESPIRATORY SYSTEM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES			
1.	<p>Respiratory passageways & alveoli-</p> <p>Pulmonary ventilation</p>	<p>List the structures that make up the respiratory system in correct order</p> <p>Discuss the functions of each structure of respiratory system</p> <p>Differentiate between the conducting and respiratory zones of respiratory passages</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	

2.	Mechanics of Respiration	<p>Basic mechanism for inspiration & Expiration</p> <p>Describe the roles of muscles of respiration in breathing</p> <p>Discuss:</p> <ul style="list-style-type: none"> - Pressure gradients - Significance of dead space <p>Boyle's law</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
3.	Lung volumes and capacities	<p>Describe lung volumes and capacities in adult male</p>	<p>Lecture</p> <p>Tutorial</p> <p>Practical</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p> <p>Practical Exam</p>	
4.	Gas exchange & Diffusion	<p>Discuss the relationship of partial pressure to a gas mixture</p> <p>Describe partial pressures of oxygen and carbon dioxide in venous and arterial blood, alveolar air and cells</p> <p>Discuss factors affecting exchange through respiratory membrane</p> <p>Compare inspired and alveolar air with regard to their composition</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
5.	Transport of gases Oxygen-Hb dissociation curve	<p>Discuss the role of partial pressure in gas transport by the blood</p> <p>Describe the transport of oxygen and carbon dioxide in blood</p> <p>Discuss the role of hemoglobin in oxygen transport</p> <p>Describe the factors affecting release or binding of oxygen to hemoglobin</p> <p>Discuss Bohr's and Haldane effects</p> <p>Interpret the oxygen hemoglobin dissociation curve graph</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	

6.	Regulation of respiration	Describe the role of the four main groups of nuclei in the medulla and pons that control breathing Discuss the factors that can influence rate and depth of breathing Describe locations of chemoreceptors that monitor blood pH and gas concentrations Discuss the role of chemoreceptors in the regulation of respiration	Lecture Tutorial	BCQs Viva SAQs	
7.	Effects of Exercise on Respiration	Discuss the Respiratory adaptaion for exercise Role of respiratory system to maintain homeostasis during Exercise	Lecture Tutorial	BCQs Viva SAQs	
8.	Respiratory disorders / Hypoxia	Discuss the causes of these respiratory disorders: <ul style="list-style-type: none"> - Emphysema - Bronchitis - Asthma - Pneumonia - Pulmonary edema - Hypoxia 	Lecture Tutorial	BCQs Viva SAQs	

COURSE TOPIC: NEUROSCIENCE

S. No	LECTURE TOPIC	TOPIC OBJECTIVES			
1.	Electrical properties of neuron	Describe the basic organization of nervous system Discuss Electrical conduction across neuronal membrane, generation of action potential and transmission of nerve signal	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
2.	Synapse	Define synapse List the properties of synapse Discuss transmission of electrical signals between neurons	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
3.	Receptors	Describe the general characteristics of receptors Classify receptors according to location and stimulus type	Lecture Tutorial Practical	BCQs Viva SAQs Practical	

		<p>Discuss the following</p> <ul style="list-style-type: none"> - Receptor potential - Transduction of sensory stimuli into nerve impulses 		Exam	
4.	Sensory pathways	<p>List the different types of sensory pathways</p> <p>Discuss the transmission of sensory information into CNS (DCML)</p> <p>Discuss the transmission of sensory information into CNS (Anterolateral system)</p>	<p>Lecture</p> <p>Tutorial</p> <p>Practical</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p> <p>Practical Exam</p>	
5.	Analgesia system Types of Pain	<p>Discuss types of pain, their qualities and pain receptors</p> <p>Discuss dual pathways for transmission of pain signals into CNS</p> <p>Discuss analgesia system in the brain and spinal cord</p> <p>Describe brain opioids system</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
6.	Spinal level of motor control Descending tracts (pyramidal & extra pyramidal)	<p>Discuss the organization of the spinal cord for motor functions</p> <p>Describe the role of muscle spindles & golgi tendon organs in muscle control</p> <p>Discuss cord reflexes</p> <p>Describe the pathway of pyramidal efferent tracts</p> <p>Compare pyramidal and extra pyramidal tracts with regard to their origin, termination and function</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p> <p>Practical Exam</p>	
7.	Brainstem	<p>Describe the major functions o</p> <ul style="list-style-type: none"> - Mid brain - Pons - Medulla oblongata <p>Discuss the control of motor functions by the brain stem</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
8.	Cerebellum	<p>Discuss the structure, functions, input and output connections of cerebellum</p> <p>Describe various cerebellar disorders</p>	<p>Lecture</p> <p>Tutorial</p> <p>Practical</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p> <p>Practical Exam</p>	

9.	Basal ganglia & Limbic system	Discuss the structure, functions, pathways and related disorders of basal ganglia List the components of limbic system Describe the functions of components of limbic system	Lecture Tutorial	BCQs Viva SAQs	
10.	Autonomic nervous system (ANS)	Discuss the general organization and activation of ANS Discuss structure and functions of sympathetic, parasympathetic nervous system and adrenal medulla Compare the divisions of the ANS with regard to origin of preganglionic fibers, location of ganglia and neurotransmitter substances Discuss the value of adrenal medullae in the function of the sympathetic nervous system.	Lecture Tutorial	BCQs Viva SAQs	
11.	Sleep (Reticular activating system)	Discuss physiology of normal sleep REM & Non-REM sleep Different phases of sleep and their characteristics	Lecture Tutorial	BCQs Viva SAQs	

COURSE TOPIC: SPECIAL SENSES & ENDOCRINOLOGY

S. No	LECTURE TOPIC	TOPIC OBJECTIVES			
1.	Vision 1	Describe all layers and parts of eye Describe the physiological functions of each part of the eye Discuss refraction and refractory structures of the eye	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	
2.	Vision 2	Discuss: <ul style="list-style-type: none"> - Errors of refraction and their corrections - Accommodation - Fluid system of eye - Anatomy of retina - Photochemistry of vision - Visual pathway and associated lesions Image formation	Lecture Tutorial Practical	BCQs Viva SAQs Practical Exam	

3.	Hearing and equilibrium	<p>Discuss physiological anatomy of ear</p> <p>Describe the role of ossicles in the process of hearing</p> <p>Draw the auditory pathway</p> <p>Discuss conductive and perceptive deafness</p> <p>Explain the role of vestibular apparatus functions in monitoring equilibrium</p>	<p>Lecture</p> <p>Tutorial</p> <p>Practical</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p> <p>Practical Exam</p>	
4.	Sense of taste	<p>Discuss types of taste sensations and their perception on tongue</p> <p>List factors affecting taste sensation</p> <p>Describe location and activation of taste buds</p> <p>Describe the gustatory pathway</p>	<p>Lecture</p> <p>Tutorial</p> <p>Practical</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p> <p>Practical Exam</p>	
5.	Sense of smell	<p>Describe the location and activation of the olfactory receptors</p> <p>Discuss the primary sensations of smell</p> <p>Describe the olfactory pathway to brain</p> <p>Define the following</p> <ul style="list-style-type: none"> - Anosmia - Hyposmia - dysosmia 	<p>Lecture</p> <p>Tutorial</p> <p>Practical</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p> <p>Practical Exam</p>	
6.	Classification & Mechanism of action of hormones	<p>Classify hormones</p> <p>Discuss endocrine hormones</p> <p>Discuss the secretion, transport, clearance and mechanism of actions of different hormones</p> <p>Describe the hormone receptors and their activation</p> <p>Differentiate between endocrine and exocrine glands</p> <p>List the major endocrine glands and their locations</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
7.	Pituitary Gland & Hypothalamo-hypophyseal system	<p>Describe the following structural and functional relationships of the hypothalamus-pituitary unit</p> <p>Discuss the control, site of action and functions of the adenohypophysis hormones</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	

		<p>Discuss the effects of hypo and hyper secretions of adenohipophysis hormones</p> <p>Correlate the function of the neurohypophysis and the hypothalamus</p> <p>Discuss the synthesis, secretions and effects of anterior and posterior pituitary hormones</p>			
8.	Growth Hormone	<p>Release of growth hormone</p> <p>Factors effecting its release</p> <p>Functions of growth hormone</p> <p>Abnormalities in release of growth hormone secretion</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
9.	Thyroid hormones	<p>Describe the formation, secretion, function and regulation of thyroid hormones</p> <p>Discuss disorders of thyroid hormones</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
10	Pancreatic hormones	<p>Discuss the following mode of action of insulin release</p> <p>Describe the functions of insulin, glucagon, somatostatin and pancreatic polypeptide.</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
11	Calcium homeostasis-1	List the hormones that regulate the calcium and phosphate homeostasis			
12	Calcium homeostasis-2	<p>Discuss the functions of parathyroid hormone, vitamin D and calcitonin</p> <p>Describe hypocalcemia and hypercalcemia</p>	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
13	Adrenal hormones 1 (Adrenal cortex)	<p>Describe the site of formation, function and control of secretion of the following adrenal hormones:</p> <ul style="list-style-type: none"> - Mineralocorticoids and - Glucocorticoids 	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
14	Adrenal hormones 2 (Adrenal Medulla)	Discuss Cushing syndrome, Cushing disease and Addison's disease	<p>Lecture</p> <p>Tutorial</p>	<p>BCQs</p> <p>Viva</p> <p>SAQs</p>	
15	Male sex	Discuss hormones specific for male	Lecture	MCQs	

	hormones	Structure and functions of male sex hormone	Tutorial	Viva SAQs	
16	Female sex hormones	Discuss hormones specific for female Structure and functions of female sex hormone	Lecture Tutorial	MCQs Viva SAQs	
17	Ovarian & Menstrual cycle	Describe ovarian and Menstrual cycle Different phases of ovarian and menstrual cycle Compare both cycles	Lecture Tutorial	MCQs Viva SAQs	

COURSE TOPIC: DIGESTIVE & URINARY SYSTEM

S. No	LECTURE TOPIC	TOPIC OBJECTIVES			
1.	Digestive system – Introduction	Describe the structural and functional organization of the digestive system. Discuss the physiological anatomy of Gastro Intestinal tract. Discuss the characteristic features of GIT smooth muscle.	Lecture Tutorial	BCQs Viva SAQs	
2.	Salivation & Salivary Gland	Describe the composition and functions of saliva. List the factors that increase salivary secretion. Discuss the nervous regulation of salivary secretion	Lecture Tutorial	BCQs Viva SAQs	
3.	Mastication & Swallowing	Discuss the chewing and swallowing reflex. Describe the function of lower esophageal sphincter Discuss the mechanisms that prevent food from entering the nasal cavity and larynx during swallowing	Lecture Tutorial	BCQs Viva SAQs	
4.	Stomach	List the functions of stomach Describe composition of gastric juice & their functions Discuss the phases of gastric secretory activity, gastric emptying and its regulation.	Lecture Tutorial	BCQs Viva SAQs	

5.	Small intestine	<p>Describe types of movement in small intestine</p> <p>Discuss the inhibition of motility and secretion in the stomach</p> <p>Discuss peristaltic rush and migrating motor complex.</p> <p>List structures that increase the absorptive surface area of the small intestine.</p> <p>Discuss the factors affecting the motility and secretion of food in the stomach.</p> <p>Describe the absorption of each type of nutrient in the small intestine.</p>	Lecture Tutorial	BCQs Viva SAQs	
6.	Liver & Gallbladder	<p>Discuss the composition, formation, conduction and functions of Bile and Bile salts.</p> <p>Describe the functions and emptying of gallbladder.</p>	Lecture Tutorial	BCQs Viva SAQs	
7.	Pancreas	<p>Describe the composition, function and role of pancreatic secretion.</p> <p>Discuss factors which affect the pancreatic secretion.</p> <p>Discuss the role of hormones in regulating pancreatic secretion.</p>	Lecture Tutorial	BCQs Viva SAQs	
8.	Large intestine, defecation reflex	<p>Describe the structure, functions and major types of movements in large intestine.</p> <p>Discuss the defecation reflex.</p> <p>Discuss functions of internal and external anal sphincters.</p>	Lecture Tutorial	BCQs Viva SAQs	
9.	Gastrointestinal hormones	<p>Discuss the secretion and role of following GIT hormones in digestion of food</p> <ul style="list-style-type: none"> - Cholecystokinin - Secretin - GIP - Gastrin - Gastrin Releasing Peptide - Pancreatic Polypeptide - Somatostatin - Vasoactive Intestinal Polypeptide 	Lecture Tutorial	BCQs Viva SAQs	

		- Motilin			
10	Nervous and hormonal Regulation of GIT	<p>Discuss the neural and hormonal control of GIT - Enteric Nervous System.</p> <p>Describe types of GIT reflexes</p> <p>Correlate the role of interstitial cells of Cajal with smooth muscle contractile activity.</p> <p>Contrast the effects of parasympathetic and sympathetic nervous activity in modulating GI activity.</p>	Lecture Tutorial	BCQs Viva SAQs	
11	Kidney function & Nephron	<p>Discuss the functional anatomy of kidney.</p> <p>Define Nephron and its types.</p> <p>Describe parts of a nephron</p> <p>Discuss the functions of kidney</p>	Lecture Tutorial	BCQs Viva SAQs	
12	Glomerular filtration rate (GFR) & its Regulation	<p>Define GFR</p> <p>State the normal range of GFR.</p> <p>Describe the glomerular filtration membrane and its function</p> <p>Discuss the forces that promote and oppose glomerular filtration.</p> <p>Discuss the significance of auto-regulation of GFR</p> <p>Describe the regulation of glomerular filtration by hormones and the nervous system</p>	Lecture Tutorial	BCQs Viva SAQs	
13	Tubular reabsorption	<p>Discuss passive and active mechanism of transport for tubular reabsorption.</p> <p>Discuss reabsorption of fluid by peritubular capillaries</p> <p>Discuss tubular reabsorption along different parts of the nephron and its regulation.</p> <p>Define tubular load and Tubular transport maximum (T_m).</p>	Lecture Tutorial	BCQs Viva SAQs	
14	Renal concentrating, diluting	<p>Discuss:</p> <ul style="list-style-type: none"> - Osmotic gradient - Counter Current Mechanism 	Lecture Tutorial	BCQs Viva	

	mechanism (Counter current mechanism)	<ul style="list-style-type: none"> - Renal mechanisms for excreting diluted urine. - Role of anti-diuretic hormone & osmoreceptors 		SAQs	
15	Micturition reflex	<p>Discuss the role of bladder in accommodating a wide range of urine volume</p> <p>Describe the neural reflex pathway that regulates emptying of bladder</p>	Lecture Tutorial	BCQs Viva SAQs	
16	Hormones acting on kidney	<p>Discuss the effect of following hormones on kidney</p> <ul style="list-style-type: none"> - ADH - Aldosterone - Angiotensin II - ANP - PTH 	Lecture Tutorial	BCQs Viva SAQs	

COURSE TOPIC: Skin

1.	Structure & Functions of Skin	<p>Structure of the Skin</p> <p>Types of cells in different layers</p> <p>Skin Functions</p> <p>Glands in skin</p> <p>Skin color</p> <p>Keratinization & Albinism</p>	Lecture Tutorial	BCQs Viva SAQs	
2.	Thermoregulation	<p>Normal Body Temperature</p> <p>Core and Shell body temp.</p> <p>Ways of measuring Body Temp</p> <p>List the mechanisms of heat production & heat loss</p> <p>Regulation of Body Temp.</p> <p>Effect of Hot & Cold environment on the body.</p>	Lecture Tutorial Practical	BCQs Viva SAQs Practical exam	

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