NISHTAR MEDICAL UNIVERSITY MULTAN

1ST PROFESSIONAL EXAMINATION MODULAR INTEGRATED CURRICULUM STUDY GUIDE-2023
NISHTAR MEDICAL UNIVERSITY MULTAN

TOOLS OF ASSESSMENT

- MCQ
- SEQ
- OSPE
- VIVA
- PRACTICAL

TOTAL MARKS

- 900

Criteria for Assessment:

- Total marks for 1st Prof. Exam will be 900
- Internal assessment will be 20%
- 5% for each block (15%)
- 5% for attendance (>75%)

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TABLE OF SPECIFICATION

1st Year MBBS

TABLE - I

Total Marks	900	**Theory**	**Viva**
Paper-I (Block-I)	300	150	150
Paper-II (Block-II)	300	150	150
Paper-III (Block-III)	300	150	150

TABLE – II

Component	Marks	Total
Theory	135	**150**
Internal Assessment	15	
OSPE	54	**150**
Viva	60	
Practical	21	
Internal Assessment	15	

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TABLE – III

	Anatomy	Biochemistry	Physiology	Pharmacology	Community	Pathology	Total
PAPER-I (BLOCK-I)	FOUNDATION MODULE & MUSCULOSKELETAL-I MODULE						
MCQ (1 Mark each)	25	25	10	05	05	05	75
SEQ (5 Marks each)	04	03	02	01	01	01	60
OSPE (3Marks each)	07	06	05	-	-	-	54
VIVA	20	20	20	-	-	-	60
Practical	10	4	7	-	-	-	21
Subject vise marks	93	85	62	10	10	10	270
PAPER-II (BLOCK-II)	MUSCULOSKELETAL-II & BLOOD IMMUNITY MODULE						
MCQ (1 Marks each)	17	19	24	05	05	05	75
SEQ (5 Marks each)	03	03	03	01	01	01	60
OSPE (3 Marks each)	06	05	07	-	-	-	54
VIVA	20	20	20	-	-	-	60
Practical	7	10	4	-	-	-	21
Subject vise marks	77	76	87	10	10	10	270
PAPER-III (BLOCK-III)	CVS MODULE & RESPIRATION MODULE						
MCQ (1 Marks each)	18	16	26	05	05	05	75
SEQ (5 Marks each)	02	03	04	01	01	01	60
OSPE (3 Marks each)	05	07	06	-	-	-	54
VIVA	20	20	20	-	-	-	60
Practical	4	7	10	-	-	-	21
Subject vise marks	70	79	91	10	10	10	270

TABLE – IV

	PAPER-I (Block-I)	PAPER-II (Block-II)	PAPER-III (Block-III)	Total
Anatomy	93	77	70	240
Biochemistry	85	76	79	240
Physiology	62	87	91	240
Pathology	10	10	10	30
Pharmacology	10	10	10	30
Community Medicine	10	10	10	30
Internal Assessment	30	30	30	90
			Total	900

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FOUNDATION MODULE CONTENT

	Module	General Anatomy	Embryology	Histology	Gross Anatomy
1	Foundation Anatomy	Introduction, terms & Planes	Cell gametogenesis, Fertilization to 2nd Week	Cell, Epithelium & Glands	Upper limb I (Shoulder till Axilla)
	Foundation Biochemistry	Cell and cell organelles, Cell membrane and transport across cell membrane, Enzymes			
	Foundation Physiology	Functional Organization of the Human Body and Control of the "Internal Environment The Cell and Its Functions Genetic Control of Protein Synthesis, Cell Function, and Cell Reproduction Transport of Substances Through the Cell Membrane Skin & Temperature regulation			
	Foundation Pathology	Cell injury, types and mechanisms Cellular adaptations Necrosis Gangrene Apoptosis			
	Foundation Community Medicine	Definitions, prevention, research, introduction, concept of health			
	Foundation Pharmacology	Introduction to pharmacology			

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MUSCULOSKELETAL-I CONTENT

	Module	General Anatomy	Embryology	Histology	Gross Anatomy
2	Musculoskeletal-I Anatomy	Bone, Joints	3rd Week to 8th week	Connective Tissue, Cartilage & Bone	Upper Limb II (Arm to Hand)
	Musculoskeletal - I Biochemistry	Amino acid chemistry, Protein chemistry, Collagen and related disorders, Elastin and related disorders, Protein separation techniques, Protein misfolding			
	Musculoskeletal-I Physiology	Nerve physiology, membrane potential & action potential, Neuromuscular junction Contraction of Skeletal Muscle, Excitation of Skeletal Muscle Contraction and Excitation of Smooth Muscle Cardiac muscle			
	Musculoskeletal-I Pathology	Development disorders of bone and cartilage			
	Musculoskeletal-I Community Medicine	Musculoskeletal disorders in occupational health			
	Musculoskeletal-I pharmacology	Routes of administration of drugs			

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MUSCULOSKELETAL-II CONTENT

	Module	General Anatomy	Embryology	Histology	Gross Anatomy
3	Musculoskeletal-II Anatomy	Integumentary system Muscles	Fetal period, Placentation, Multiple gestation, development of muscles, vertebral column, limbs & integumentary system	Integumentary system & Muscles	Lower Limb I (Hip to Knee Joint)
	Musculoskeletal-II Biochemistry	Nucleic acid, Genetics, Cancer			
	Musculoskeletal-II Physiology	Action potential and excitation contraction coupling in cardiac muscle, Specialized excitatory and conductive system of the heart, Comparison between Skeletal, Smooth &Cardiac Muscles, Cardiac output, heart sounds. ECG			
	Musculoskeletal-II Pathology	Metabolic diseases of bone Osteopenia, Osteoporosis, Osteomalacia ,Rickets, Hyperparathyroidism, Pagets disease , pyogenic osteomyelitis, Mycobacterial Arthritis, Osteoarthritis and Rheumatoid arthritis, Gout Types of fractures, healing of fractures			
	Musculoskeletal-II Community Medicine	Musculoskeletal disorders in health prevention			
	Musculoskeletal-II Pharmacology	Basic principles of pharmacokinetics I			

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BLOOD AND IMMUNITY MODULE CONTENT

	Module	General Anatomy	Embryology	Histology	Gross Anatomy
4	Blood & Immunity Anatomy	Lymphatic System	Thymus Spleen Lymph Node Tonsil	Thymus Spleen Lymph Node Tonsil	Lower Limb II (Leg to Foot)
	Blood & Immunity Biochemistry	Hemoglobin, Oxygen dissociation curve, Hemoglobinopathies, Heme synthesis, Porphyria's, Heme degradation, Jaundice, Plasma proteins, Immunoglobulins, Vitamin B12, folic acid, Iron, AIDs, Vitamins and Minerals			
	Blood & Immunity Physiology	Red Blood Cells, Anemia, and Polycythemia Resistance of the Body to Infection: I. Leukocytes, Granulocytes, the Monocyte-Macrophage System, and Inflammation Resistance of the Body to Infection: II. Immunity and Allergy Blood Types; Transfusion; Tissue and Organ Transplantation, Hemostasis and Blood Coagulation			
	Blood & Immunity Pathology	Hematological aspects of jaundice, hemoglobinpathies, hemesynthesis Iron deficiency anemia Megaloblastic anemia White cell disorders, types of white cells, causes of neutrophilia / neutropenia, leukocytosis / leucopenia, monocyticlevcocytosis / monocytopenia, eosinophilia / eosiopenia Overview of immunity, origin of immune cells Adaptive immunity			
	Blood Community Medicine	Immunology, EPI			
	Blood pharmacology	Basic principles of pharmacokinetics I			

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CVS MODULE CONTENT

	Module	General Anatomy	Embryology	Histology	Gross Anatomy
5	Cardiovascular System Anatomy	Cardiovascular System	Heart & Vessels	Heart & Vessels	Mediastinum, Hear, Great Vessels
	Cardiovascular System Biochemistry	Carbohydrate chemistry , Lipid chemistry			
	Cardiovascular System Physiology	The Heart as a Pump and Function of the Heart Valves& regulation of heart pumping, cardiac cycle Rhythmical Excitation of the Hear &Specialized excitatory & conductive system of the heart & its control (revisit) Electrocardiogram, its interpretation & its abnormalities Cardiac output, heart sounds Medical Physics of Pressure, Flow, and Resistance, Vascular Distensibility and Functions of the Arterial and Venous Systems Microcirculation and the Lymphatic System, Local and Humoral Control of Blood Flow by the Tissues Nervous Regulation of the Circulation, and Rapid & Long-Term Control of Arterial Pressure, hypertension Cardiac Output, Venous Return, and Their Regulation Muscle Blood Flow and Cardiac Output During Exercise; the Coronary & regional circulation Cardiac Failure, Circulatory Shock Heart Valves and Heart Sounds; Dynamics of Valvular and Congenital Heart Defects Functions of veins: Central venous pressure and peripheral venous pressures Physiology of blood vessel , ECG changes in myocardial hypertrophies, Ischemic heart disease Blocks &Arrhythmias, ECG changes in electrolyte imbalance			
	Cardiovascular System Pathology	Atherosclerosis, ischemic heart disease, myocardial infarction, cardiogenic shock, cardiac failure, cardiac arrhythmias, septal defects			
	Cardiovascular Community Medicine	Hypertension and prevention			
	Cardiovascular Pharmacology	Basic principles of pharmacokinetics 2			

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RESPIRATORY SYSTEM MODULE CONTENTS

	Module	General Anatomy	Embryology	Histology	Gross Anatomy
6	Respiratory System Anatomy	Respiratory System	Development of body cavities, Upper & Lower Respiratory System	Upper & Lower Respiratory System	Upper & Lower Respiratory System
	Respiratory System Biochemistry	pH, Electron transport chain, Oxidative phosphorylation, Normal acid base regulation, physiochemical properties			
	Respiratory System Physiology	Pulmonary Ventilation, Pulmonary Volumes and Capacities, Alveolar Ventilation, Functions of the Respiratory Passageways Pulmonary Circulation, Pulmonary Edema, Physical Principles of Gas Exchange; Diffusion of Oxygen and Carbon Dioxide Through the Respiratory Membrane Transport of Oxygen and Carbon Dioxide in Blood and Tissue Fluids Regulation of Respiration Useful Methods for Studying Respiratory Abnormalities, Respiratory Insufficiency, Hypoxia & Oxygen Therapy, Hypercapnia & Artificial Respiration Respiratory changes during Exercise, Aviation, Space & Deep-Sea Diving Physiology			
	Respiratory System Pathology	Obstructive lung disease, restrictive lung disease, granulomatous lung disease, vascular diseases of lung, tumors of lung, diseases of pleura			
	Respiratory Community Medicine	Pneunoconiosis, communicable disease i.e. T.B., Influenza, Covid, ARIs, Pertussis			
	Respiratory Pharmacology	Basic principles of pharmacokinetics 2			

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COMPETENCIES OF BIOCHEMISTRY

Papers	Module	Competencies	Relevance
Paper-I Block-I	Foundation	**CELL & CELL ORGNAELLES:** 1. Biochemical composition and functions of the cell 2. Cell membranes and their chemical composition 3. Importance of lipids and proteins in cell membranes 4. Chemistry of signals and receptors 5. Membrane transport including active transport, passive transport, simple andfacilitated diffusion	Essential
		6. Methods to study cell biochemistry 7. Disorders related to cell and cell organelles	Important
		ENZYMES: 1. Classification/ Nomenclature 2. Enzymes and catalysts 3. Function of enzymes and catalysts 4. Co-enzymes and co-factors 5. Iso-enzymes and their clinical importance 6. Factors affecting enzyme activity (Michaelis – Menten and Lineweaver Burk Equations) 7. Classification of enzyme inhibitors and their biochemical importance 8. Regulation of enzyme catalytic activities 9. Feedback regulation 10. Reversible covalent modification	Essential
		11. Therapeutic use and application of enzymes in clinical diagnosis	Important
	Musculoskeletal I Biochemistry	**PROTEINS:** 1. Structure, functions and properties of amino acids 2. Amino acids and their nutritional significance 3. Importance of amino acids in pH maintenance 4. Introduction, classification and biochemical importance of Proteins 5. Physicochemical , functional nutritional and structural properties of proteins 6. Separation of proteins, salting out, electrophoreisis, chromatography andcentrifugation	Essential
		7. Techniques 8. Clinical importance of proteins and amino acids 9. Disorders related to amino acids and protein chemistry	Important
		EXTRACELLULAR MATRIX: 1. Composition and functions of extracellular matrix 2. Types and structure of collagen, collagenopathies (Ehlers-Danlos syndrome (EDS) and ostegenesis imperfecta (OI)) 3. Structural characteristics of elastin, role of alpha I – antitrypsin in elastin degradation 4. Fibrillin-I and laminin with their chemical importance	Essential

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		5. Adhesive proteins	
		6. Collagenopathies 7. Genetic disorders related to elastin, fibrillin and laminin	Important
Paper-II Block-II	Musculoskeletal II Biochemistry	**NUCLEOTIDE AND NUCLEIC ACIDS** 1. Structure, function and types of nucleic acids 2. Structure, function and biochemical role of nucleotides 3. Synthesis of purines and pyramidines nucleotides 4. Degradation of purines and pyramidines nucleotides	Essential
		GENETICS: 1. Replication 2. Transcription 3. Translation 4. Gene expression and regulation 5. Mutation **CANCER:**	
		1. Disorders associated with purine nucleotide metabolism (ADA, hyperuricemia, purine nucleoside phosphorylase) 2. Natural and synthetic derivatives of purines and pyrimidines and their role in health and disease	Important
	Blood & Immunity	**HEMOGLOBIN** 1. Introduction of porphyrins 2. Metabolism of haem 3. Synthesis, structure, types and functions of hemoglobin 4. O_2 binding capacity of hemoglobin and factors regulating & affecting it 5. Haemoglobinopathies 6. Breakdown of hemoglobin, formation of bile pigments their transport andexcretion 7. Causes and types of Jaundice 8. Porphyria	Essential
		1. Porphyria 2. Haemoglobinopathies	Important
		PLASMA PROTEINS & Immunoglobulins 1. Immunoglobulins and their biochemical function 2. Plasma proteins and their clinical function	
		VITAMINS & MINERALS 1. Vitamins and their different types 2. Classification of vitamins, their chemical structure & biochemical function 3. Absorption of vitamins and minerals 4. Daily requirements, sources of water and fat soluble vitamins 5. Effects of vitamin deficiency 6. Role of vitamins as co-enzymes	Essential

		7. Hypervitaminosis 8. Minerals in human nutrition, sources, biochemical actions and recommendeddaily allowance (RDA). 9. Sodium, potassium, chloride, calcium, phosphorus, magnesium, sulfur, iodine, fluorideetc. 10. Trace elements as Fe, Zn, Se, I, Cu, Cr, Cd and Mn	
		1. Disorders related to vitamins and minerals	Important
Paper-III Block-III	Respiration	**BIOENERGETICS AND OXIDATIVE PHOSPHORYLATION** 1. Exergonic and endergonic reactions 2. Free energy and free energy change 3. Electron transport chain (ETC) components, reactions and organization 4. Oxidative Phosphorylation, ATP synthesis, chemiosmotic theory 5. Inhibitors and uncouplers of oxidative phosphorylation	Essential
		ACID BASE BALANCE AND BODY FLUIDS 1. Ionization of water, week acids and bases 2. pH and pH scale 3. pK values, dissociation constant and titration curve of week acids 4. Body buffers and their mechanism of action 5. Henderson – Hesselbach equation 6. Acid base regulation in human body 7. Biochemical mechanisms for control of water and electrolyte balance 8. Types of particles in solution 9. Importance of selectively permeable membranes, osmosis and osmoticpressure, surface tension, viscosity also in relation to body fluids	
	Cardio Vascular System	**CARBOHYDRATES** 1. Carbohydrates, their biochemical function and classification 2. Structure, functions and derivatives of monosaccharides 3. Structure and function of oligosaccharides and disaccharides 4. Polysaccharides and their biochemical role 5. Homopolysaccharides of biologic significance and their structural and functional characteristics 6. Structural and functional characteristics of heteropolysaccharides including detail of glycosaminoglycans, proteoglycans, peptidoglycan and mucopolysaccharidoses	
		1. Clinical importance of carbohydrates 2. Disorders related to glycosaminoglycans	Important
		Lipids 1. Classification of lipids and their biochemical functions 2. Structure and biochemical functions of phospholipids, glycolipids, and sphingolipids 3. Classification of fatty acids and their biochemical functions	Essential

		4. Functions of essential fatty acids 5. Eicosanoides and their function in health and disease 6. Steroids and their biochemical role 7. Cholesterol, its structure chemistry and function 8. Lipid peroxidation and its significance	
		1. Clinical significance of lipids 2. Clinical importance of steroids	Important

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Modular Practical Contents of Biochemistry

1st Year MBBS

Papers	Module	Competencies	Relevance
Paper-I Block-I	Foundation & Musculoskeletal I	General Introduction: Laboratory Hazards & safety measures Biuret's Test Ninhydrin Test Millon's Test and Xanthoproteic Test Saka Guchi's Test and lead Sulphide Haysulpher Test Fractional precipitation of protein Test for Protein and Blood in Urine	Essential
Paper-II Block-II	Musculoskeletal II & Blood Immunity	Urine Test for Bile Pigment & Bile Salt Normal Physical urine examination Normal Microscopic urine examination and Abnormal urine report Solution-Units (PDF) RBC Haemolysis Surface Tension	Essential
Paper-III Block-III	Respiration & Cardio Vascular System	Molish's Test Iodine Test Benedict's Test Barfoed's Test Tollen's Test Salivinoff's Test Hydrolysis of Starch Osazone Test Carbohydrate Scheme Normal Chemical urine examination test for Sugar Qualitative Tests for Lipids Normal Chemical urine examination: Test for Ketone Bodies	Essential

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COMPETENCIES OF ANATOMY

Papers	Module	Competencies	Relevance
Paper-I Block-I	Foundation	**GENERAL ANATOMY** 8. Introduction 9. Body planes	Essential
		EMBRYOLOGY 12. Cell 13. Gametogenesis 14. Fertilization	Essential
		HISTOLOGY 1. Epithelium and glands 2. Connective tissue	
		GROSS ANATOMY 1. Pectoral region 2. Shoulder 3. Axilla	
	Musculoskeletal I Anatomy	**GENERAL ANATOMY** 10. Osteology 11. Joints	Essential
		HISTOLOGY 8. Cartilage 9. Bone	Essential
		EMBRYOLOGY Week I- VIII of development **GROSS ANATOMY** 1. Arm 2. Forearm 3. Hand	Essential

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Paper-II Block-II	Musculoskeletal II Anatomy	**GENERAL ANATOMY** 1. Skin (integumentary system) 2. Muscles	Essential
		HISTOLOGY 1.Skin 2.Muscle	
		EMBRYOLOGY 3. Fetal membranes and placentation, multiple gestation 4. Development of muscles, limbs, vertebral column and integumentary system	Essential
		GROSS ANATOMY 1. Gluteal region 2. Hip joint 3. Thigh 4. Knee joint	
	Blood & Immunity	**GENERAL ANATOMY** 9. Lymphatic system	Essential
		EMBRYOLOGY: 3. Development of thymus. Spleen. Lymph node, tonsil	Essential
		HISTOLOGY 3. Thymus 4. Spleen 5. Lymph node 6. Tonsil	Essential
		GROSS ANATOMY 1. Leg 2. Ankle joint 3. Foot	Essential

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Paper-III Block-III	Respiration	**GENERAL ANATOMY** Respiratory system	Essential
		EMBRYOLOGY Development of body cavities, upper and lower respiratory system	
		HISTOLOGY Respiratory system	
		GROSS ANATOMY 1. Thoracic cage 2. Diaphragm 3. Lungs 4. Respiratory tree	
	Cardio Vascular System	**GENERAL ANATOMY** Cardiovascular system	
		EMBRYOLOGY Development of Heart and vessels	Essential
		HISTOLOGY 1. Heart 2. Artery 3. Vein	Essential
		GROSS ANATOMY 1. Mediastinum 2. Heart 3. Great vessels	Essential

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COMPETENCIES OF PHYSIOLOGY

Content (Modular Curriculum - Theory) Physiology – 1st Year MBBS, 2023

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Content	Units	Competencies	Relevance
Paper-I (Block-I)	Foundation	1. Homeostasis 2. Feedback Mechanisms 3. 2nd Messenger Systems 4. Apoptosis & Phagocytosis 5. Cellular Transports 6. Osmolarity/Osmolality 7. Doman's Equilibrium 8. Cellular Junctions 9. Structure of DNA 10. Protein Synthesis 11. Transcription 12. Translation 13. Post-Translational Modification 14. Mutations 15. Cell cycle	Essential
		16. Disorders of Cell Cycle & Protein Synthesis	Important
		17. Genetic Disorders	Supplementary
	Nerve Physiology	1. Resting Membrane Potential 2. Ionic Basis of Action Potential 3. Nerve Potential 4. Skeletal/Smooth/Cardiac Muscle Potential 5. Pacemaker Potential 6. Spike Potential & Migratory Motor Complex 7. Physiological Differences Between Various Potentials 8. Potential Summation 9. Synaptic Communications 10. Nerve Conduction 11. Saltatory Conduction 12. Neuro-Muscular Junction 13. Tetany/Tantalization/Tetanus 14. Effects of Ionic Imbalance on Various Potentials 15. Effects of Respiratory/Metabolic Acidosis/Alkalosis on Various Potentials 16. Epilepsy	Essential
		17. Homeostatic Abnormalities Affecting Conduction 18. Disorders of Neuromuscular Junction	Important
		19. Genetic Disorders Affecting Nerve Conduction 20. Biochemical Disorders Affecting Nerve Conduction 21. Inflammatory Disorders Affecting Nerve Conduction 22. Nerve Conduction Studies 23. Electro-Encephalo-Graphy	Supplementary

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Content	Units	Competencies	Relevance
Paper-II (Block-II)	Muscle Physiology	1. Physiological Organization of Skeletal Sarcomere 2. Physiological Organization of Muscle Spindle 3. Importance of Alpha-Gamma Co-Activation in Muscle Contraction 4. Physiological Organization of Dystrophin-Dystroglycan Complex 5. Ionic Basis of Muscle Potential 6. Cellular Signaling Associated with Muscle Potential 7. Physiology of DHPT, RyR Receptors and SERCA Pump 8. Motor Unit 9. End Plate Potential 10. Excitation Contraction Coupling 11. Trappe's Effect 12. Physiological Types of Skeletal Contractions 13. Muscle Fatigue 14. Drugs Affecting Neuro-Muscular Physiology 15. Toxins Affecting Neuro-Muscular Physiology 16. Anesthesia & Neuromuscular Physiology 17. Physiological Organization of Smooth Muscle Contractile Unit 18. Latch Mechanism 19. Regulation of Smooth Muscle Contraction 20. Physiological Comparison of Skeletal/Smooth/Cardiac Muscle Contraction	Essential
		21. Myasthenic Syndromes 22. Dystrophies 23. Atrophy, Hypertrophy, Denervation Atrophy 24. Malignant Hyperthermia 25. Rigor Mortis	Important
		26. Biochemical Disorders Affecting Muscle Contraction 27. Organic/Traumatic/Inflammatory Disorders Affecting Muscle Contraction 28. Muscle Types Based on Metabolism & Their Contractile Physiology 29. Electromyography	Supplementary

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Content	Units	Competencies	Relevance
Paper-II (Block-II) (Continued)	Hematology	1. Physiological Organization of RBC 2. Hemopoiesis 3. Hb Synthesis 4. Iron Metabolism 5. Anemias 6. Effect of Anemia of Cardiovascular Stability 7. Polycythemia 8. Effect of Polycythemia on Cardiovascular Stability 9. Bone Marrow Aplasia & Pancytopenia 10. Platelets & Hemostasis 11. Coagulation Factors & Hemostasis 12. Extrinsic & Intrinsic Pathways of Hemostasis 13. Natural Clot Dissolution 14. Thromboembolic states & Management 15. Importance of Streptokinase, Heparin & Warfarin 16. PT, APTT & INR 17. Dengue Fever 18. Blood Groups 19. Transfusion Reactions 20. Erythroblastosis Fetalis	Essential
		21. Genetic Disorders of RBC Dysfunction 22. Jaundice & Metabolism of Bilirubin	Important
		23. Biochemical Disorders Of RBC/Platelet Dysfunction 24. Autoimmune Disorders of RBC/Platelet Dysfunction	Supplementary
	Immunology	1. Leucopoiesis 2. Lines of Defenses Against Infection 3. Innate & Acquired Immunity 4. Types of B/T Cells, Antibodies & Their Functions 5. Activation of Macrophage 6. Macrophage Dependent Activation of B/T Cells 7. Structure of Antibody 8. Process of Formation of Antibodies 9. Complement System & Its Activation 10. Special Enzymatic Systems of Various Immune Cells 11. Enzymatic Basis of Respiratory Burst Within Immune Cells 12. HIV & Immune System 13. Viral/Bacterial/Parasitic/Fungal Infection & Immune System 14. Inflammation & Immune System 15. Anaphylaxis, Septicemia & DIC	Essential
		16. Leukemias & Lymphomas 17. Hypersensitivity Reactions	Important
		18. Biochemical & Genetic Disorders of Immune System	Supplementary

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Content	Units	Competencies	Relevance
Paper-III (Block-III)	Cardiac Physiology	1. Cardiac Conduction System 2. Physiological Basis of Pacemaker Potential 3. Physiological Basis for Cardiac Muscle Potential 4. Effect of Ionic Imbalance on Pacemaker/Cardiac Muscle Potential 5. Effect of Neurological Imbalance on Pacemaker/Cardiac Muscle Potential 6. ECG With Basic Waveforms/Intervals/Segments 7. Physiological Basis for ECG Recording 8. Angina Pectoris & Myocardial Ischemia 9. Myocardial Ischemia & Heart block/Arrhythmias 10. Circus Movement & Arrhythmias 11. Types of Heart Blocks & Common Arrhythmias	Essential
		12. Identification/Interpretation of ECGs With Heart Blocks & Myocardial Ischemia 13. Antiarrhythmic Drugs	Important
		14. Identification/Interpretation of Common Arrhythmias On ECG	Supplementary
	Vascular Physiology	1. Cardiac Cycle 2. Left Ventricular Volume Pressure Loop & Common Physiological Shifts It Encounters 3. Intrinsic/Ionic/Neurological/Metabolic Regulation of Cardiac Output 4. Hemodynamic Laws 5. Hemodynamic Forces & Interstitial Fluid 6. Edema/Effusion/Ascites 7. Blood Pressure 8. Short Term/Long Term Control of Blood Pressure 9. Cardiovascular Reflexes 10. Exercise & Hemodynamic Stability 11. Essential Hypertension, Eclampsia, Goldblatt Hypertension, Coarctation of Aorta & Hypertension, Neurogenic Hypertension 12. Commonly Used Drugs for Hypertension 13. Physiology/Types/Management of Circulatory Shock	Essential
		14. Cardiac Output-Venous Return Graphs & Their Shifts 15. Congestive Cardiac Failure 16. Vasculogenic – Physiological Control & Retrolental Fibroplasia	Important
		17. Common Investigations to Diagnose the Cause of Hypertension, Cardiac Failure, Pulmonary Hypertension	Supplementary

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Content	Units	Competencies	Relevance
Paper-III (Block-III) (Continued)	Respiratory Physiology	1. Pulmonary Dynamics 2. Pulmonary Compliance & Surfactant 3. Pulmonary Volumes & Capacities 4. Dead Space – Importance & Measurement 5. Cough/Sneeze Reflex 6. Pulmonary Hemodynamics 7. Lung Zones & Zone 1 Circulation 8. Pulmonary Edema/Pleural Effusion Hemodynamics 9. Pulmonary Laws & Diffusion/Solubility Coefficient 10. Renewal of Alveolar Air 11. Pulmonary Membrane-Organization & Physiology 12. Ventilation Perfusion Ratio 13. Transport of O2/CO2/CO 14. Hb-O2 Dissociation Curve & Its Shifts 15. Haldane & Bohr's Effects 16. Utilization Coefficient & Its Importance 17. CO Poisoning & Its Graphs 18. Respiratory Quotient & Its Importance 19. Respiratory Center – Organization & Physiology 20. Biochemical/Neurological/Metabolic Regulation of Respiration 21. Exercise & Respiration 22. Respiratory Reflexes & Cheyne Stroke Breathing 23. Sleep Apnea 24. Hypoxia & Hypercapnia 25. Respiratory Acidosis/Alkalosis 26. Obstructive & Restrictive Lung Disorders - Changes in Compliance/Ventilation Perfusion Ratio/Lung Volume Ratios	Essential
		27. COVID-19, Pneumonia & Tuberculosis 28. Ciliary Hypomotility Disorders	Important
		29. Blue Blotters/Pink Puffers 30. Pulmonary Hypertension & Eisenmenger Syndrome	Supplementary
	High Altitude & Deep-Sea Physiology	1. Effects of Various Heights on Human Physiology 2. Acclimatization 3. Motion Sickness & Management 4. Effects of Various Ocean Depths on Human Physiology 5. Caisson's Disease 6. Biophysics of Parachute Diving 7. Effect of Gravitational Changes on Human Physiology 8. Effects of Weightlessness on Physiology of Astronauts	Essential

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		9. Biophysics of Artificial Ventilator/Metallic Lung 10. SCUBA Diving	Important
		11. Space Physiology	Supplementary

Content (Modular Curriculum – Practical) Physiology – 1st Year MBBS, 2023
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Content	Units	Competencies	Relevance
Physiology Practical	Foundation	1. Recording of Body Temperature 2. Recording of Blood Pressure	Essential
	Nerve & Muscle Physiology	3. Nerve Conduction Study/Graph Interpretation 4. Electromyography/Graph Interpretation 5. Electroencephalography/Graph Interpretation	Important
	Hematology	6. RBC Count/Report Interpretation 7. Platelet Count/Report Interpretation 8. CT/BT, PT/APTT, ESR & Blood Grouping/Report Interpretation	Essential
	Immunology	9. WBC Count/Report Interpretation 10. Differential Leukocyte Count/Report Interpretation	Essential
	Cardiovascular Physiology	11. Examination of Precordium 12. Auscultation of Heart Sounds & Murmurs 13. Examination of Pulse & Its Variations/Abnormalities 14. Recording of ECG 15. Interpretation of Normal ECG 16. Interpretation of Heart Blocks & Cardiac Ischemia on ECG 17. Identification & Interpretation of Ionic Imbalances Presenting with ECG Abnormalities	Essential
	Respiratory Physiology	18. Auscultation of Breath Sounds 19. Spectrograph 20. Spirometry & Interpretation of Its Graph 21. Identification of Obstructive/Restrictive Disorders on Spirometer Readings	Essential

Interpretation Of The Relevance Of A Particular Competency From Examination Point Of View

22. **Essential – Will ALWAYS Be Asked From**
23. **Important – Will Be Asked from At MOST OF THE TIMES**
24. **Supplementary – NOT IRRELEVANT & COULD BE ASKED From**