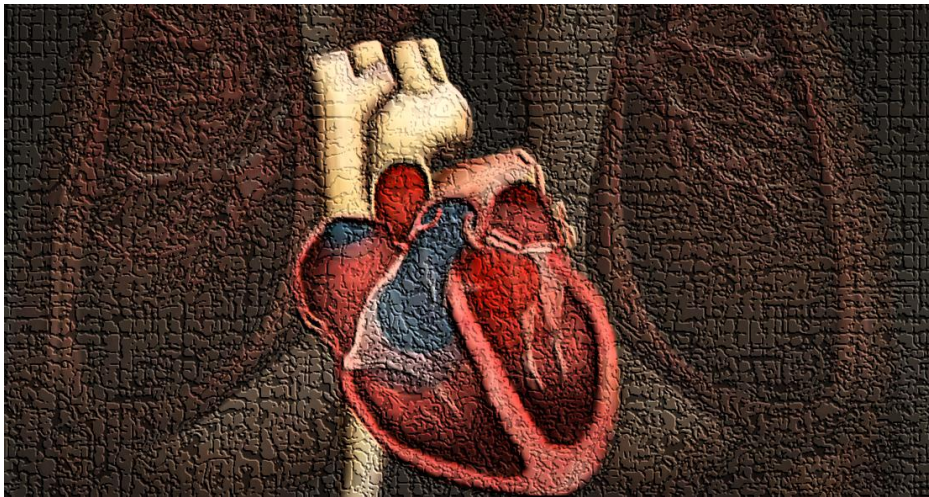




**LAHORE
MEDICAL & DENTAL
COLLEGE**

**PHYSIOLOGY STUDY GUIDE
FIRST YEAR BDS
2023**



DEPARTMENT OF PHYSIOLOGY LM&DC, LHR

INTRODUCTION

The purpose of this study guide is to give an insight to the students about their specified course content, assessment plan, teaching strategies and learning resources. It may further facilitate the learners to plan their educational activities in the subject of Physiology. This study guide has been organized keeping in view of PM&DC and UHS guidelines for BDS curriculum. PM&DC has outlined the guiding principles for the undergraduate medical curriculum and has also defined the generic competencies and desired outcomes for a medical graduate; to provide optimal health care for patients and societies. These generic competencies set the standards for all physicians and form a part of the identity of a doctor.

DURATION OF COURSE

One year (1st year BDS students)

LEARNING OBJECTIVES (*knowledge, skills, attitude*)

1. To equip the students with specific knowledge, essential skills and appropriate attitude in their desired field.
2. To enable the students to understand the functions of each organ system of the body and integrate the functioning with the knowledge of anatomy and biochemistry.
3. To perceive how basic physiological systems, interact to overcome the stressful and challenging conditions.
4. To think critically and apply the physiological relevance with the clinical situations and explain the pathophysiology of common diseases.
5. To become problem solvers, understanding effectively familiar and common problems.
6. To direct their own learning and evaluate this activity. To become lifelong learners.
7. To be able to reason critically, analyze situations and make justifiable decisions regarding common clinical scenarios.
8. To be able to demonstrate professional values of self and professional accountability, probity and ethics.

**Department of Physiology
Hierarchy tree**

**Professor. Dr. Anser Asrar
Head of the Department**

**Professor Dr. Uzma Zargham
Class In charge BDS**

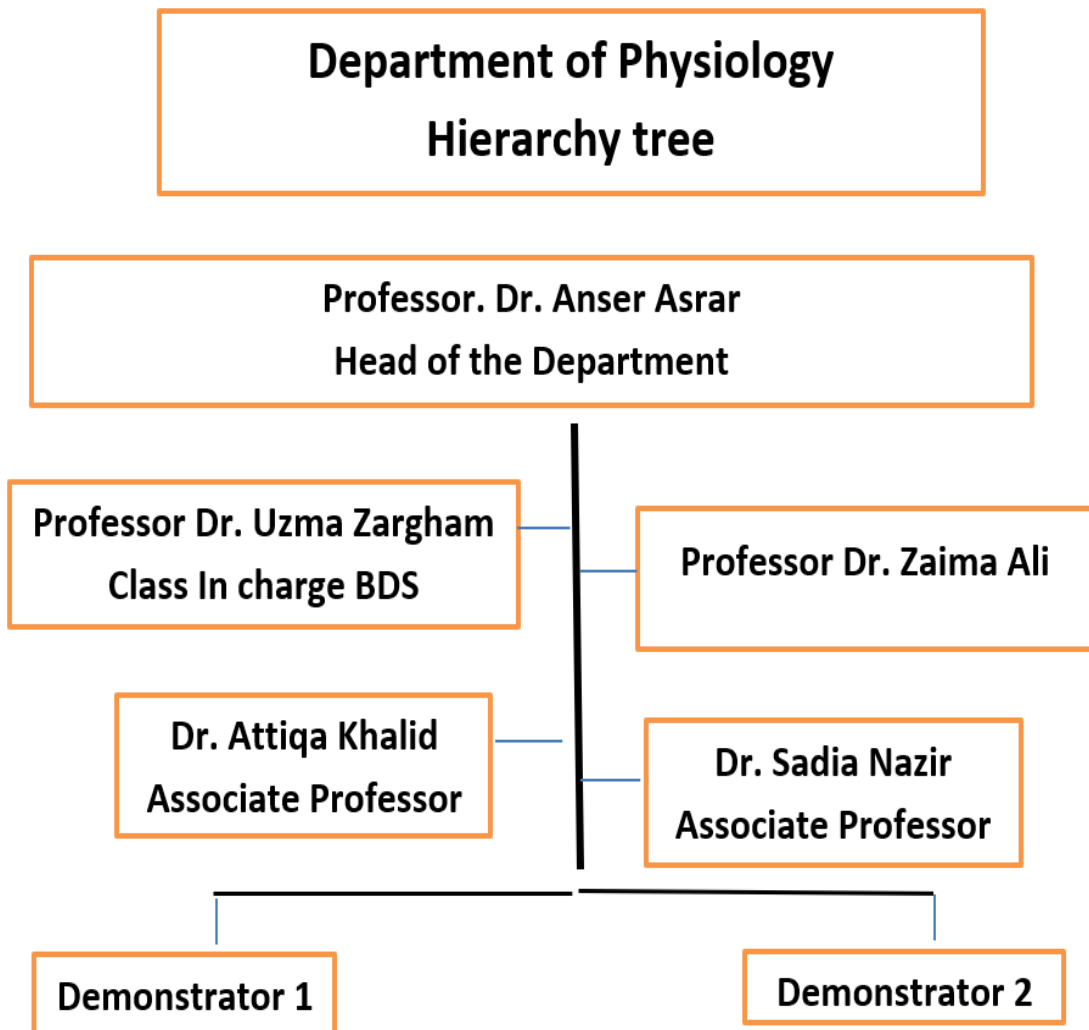
Professor Dr. Zaima Ali

**Dr. Attiqa Khalid
Associate Professor**

**Dr. Sadia Nazir
Associate Professor**

Demonstrator 1

Demonstrator 2



PHYSIOLOGY SYLLABUS

Revised Curriculum of BDS - 2003

PHYSIOLOGY

The functional organization of human body as whole & homeostasis with special reference to the application of physiology in dentistry and comprising the following:-

Cell Physiology

Organization of the cell; Physical characteristics – membranous structures, organelles, nucleus; Functional system of the cell – endocytosis, pinocytosis, phagocytosis, synthetic functions, exocytosis, energy production, cell movements & locomotion. Common abnormalities of cell function and their clinical relevance.

Nerve- Muscle Physiology

Transport of Ions & molecules – diffusion, active transport; Membrane potentials and action potentials; Conduction of nerve impulse. Physiologic anatomy of skeletal and smooth muscle and mechanisms of muscle contraction. Neuromuscular transmission. Common diseases like myasthenia gravis etc

Cardiovascular System

Structure and physiology of cardiac muscle

Specialized excitatory & conductive system of heart

Cardiac Cycle

Heart Sounds

Regulation of heart pump

ECG basics, recording and interpretation; correlation of cardiac cycle with ECG and heart sounds.

Cardiac arrhythmias

Circulation; the concept of pressure, flow & resistance

Functions of arterial & venous systems

Microcirculation and lymphatic system

Control & regulation of blood flow

Regulation of peripheral vascular resistance

Arterial pulse

Arterial pressure regulation (short-term/ long-term) – hypertension types and consequences

Regulation of venous return

Cardiac output regulation and measurement.

Coronary circulation

Changes in exercise

Ischemic heart disease; cardiac failure; circulatory shock etc heart murmurs and echocardiography

Respiration:

- Basic organization of respiratory system
- Mechanics of pulmonary ventilation
- Pulmonary volumes & capacities and their clinical relevance
- Dead space (anatomical and physiological)
- Principles of gas exchange and transport in blood
- Nervous and chemical regulation of respiration;
- Breathing patterns
- Respiratory changes in exercise, high altitude, deep sea diving

- Hypoxia – causes, types and effects
- Dyspnea – causes, types and effects
- Apnea, including obstructive sleep apnea
- Tachypnea
- Cyanosis – causes, types and effects
- Respiratory insufficiency
- Artificial respiration and oxygen therapy

Blood Physiology

- Red blood cells, production, functions, regulation
- Formation of hemoglobin, iron metabolism,
- Anemia & polycythemia
- Production & functions of leukocytes
- Blood groups transfusion, transfusion reactions, tissue & organ transplantation
- Hemostasis & blood coagulation
- Platelets, production, regulation and functions
- Thrombocytopenias
- The clotting cascade
- Hemophilia, Von Willebrand disease; Christmas disease
- Bleeding time and clotting screen

Gastro-intestinal System

- General structure & organization
- Principles of GIT movements
- Mastication, deglutition,
- Peristalsis mechanism and control
- Vomiting mechanism and control
- Defecation mechanism and control
- Movements and functions of stomach, small intestine and large intestine
- Secretory functions (saliva, gastric juice, pancreatic juice, intestinal juice & bile)
- GIT hormones

Digestion & absorption & assimilation

Functions of liver & bilirubin formation & excretion; Jaundice.

Liver function tests

Renal Physiology

Structure and functions of kidneys

Glomerular filtration, factors affecting and measurement

Renal blood flow

Urine formation, micturation;

Renal regulation of blood volume & extra cellular fluid volume

Regulation of acid-base balance

Endocrine System:

General organization & importance of endocrine system

Chemistry, synthesis, storage, functions, control and abnormalities of pituitary, thyroid, parathyroid pancreatic, and adrenal hormones

Hormonal assays and interpretation

Nervous System:

Organization of the nervous system

Synaptic transmission

Basic concepts of sensory, motor and integrative functions of nervous system including various pathways

Cerebral blood flow and cerebrospinal fluid system

Physiology of pain with emphasis on endogenous pain control mechanisms

Organization and functions of spinal cord

Organization and functions of sensory cortex

Organization and functions of motor cortex; pyramidal and extra pyramidal pathways; presentation and interpretation of common upper and lower motor neuron lesions

Organization and functions of cerebellum & basal ganglia in overall motor control - Parkinsonism

Thalamus- organization, nuclei and functions

Functions of hypothalamus

Temperature regulation

States of brain activity – sleep, brain waves, epilepsy & psychoses.

Organization and functions of autonomic nervous system

Special senses-elementary knowledge of structure and physiology of the special sense organs.

Laboratory Assignments

Hematology

- Study of the microscope
- RBCs Count
- Hematocrit
- Determination of Hemoglobin (Hb%)
- Packed cell volume (PVC)
- Total leukocyte count (TLC)
- Differential leukocyte count (DLC)
- Erythrocyte sedimentation rate (ESR)

- Bleeding time (BT)
- Prothrombin time
- Thrombin time
- Blood grouping

Respiratory system

- Measurement of pulmonary volumes and capacities (Spirometry)
- Stethography

Nervous system

- Examination of superficial reflexes
- Examination of deep reflexes
- Examination of sensory, motor system
- Clinical examination of cranial nerves

Cardiopulmonary resuscitation

Triple response

Examination of arterial pulse

ECG recoding/interpretation

Measurement of arterial blood pressure

Effect of exercise & posture on BP

Examination of apex beat

Heart sounds – auscultation of normal sounds/murmurs

Recording of body temperature

Content of the respective syllabus pertains to all three domains of learning, i.e. knowledge, skills and behavior

1st YEAR BDS ACADEMIC PLANNER (2023)

SUBJECT OF PHYSIOLOGY

Subject	Physiology
Total Hours	252 hours
Total no. of sessions in 36 weeks	7 per week X 36= 252 hours
Duration of each session per week	45 minutes = 3 60 minutes = 2 75 minutes = 1 90 minutes = 1
Course of Action	February 2023 to November 2023

ALIGNMENT OF EDUCATION WITH STUDY HOURS

(1st year BDS-2023)

Sr #	Topic	Sessions	Study hours
1.	Cell	9	9 hours
2.	Nerve & Muscle	22	21 hours
3.	Blood	15	16 hours
4.	Endocrinology	22	22 hours
5.	Respiration	18	16 hours
6.	Heart	18	16 hours
7.	Renal Physiology	18	18 hours
8.	Circulation	21	16 hours
9.	Sensory system	14	12 hours
10.	Motor system	24	26 hours
11.	GIT	8	8 hours
12.	Special senses	8 2 1	10 hours
13.	Environmental physiology	10	8 hours
Total	Theory/experimental sessions/hours	210	198
	Practical hours (1.5 hour/week)	36	54 hours
		246	252 hours

Academic Calendar

Dates-2023	Weeks	Lectures	Practicals
20 th to 24 th Feb	1	UNIT I -- Introduction to Physiology--The Cell	Microscope
27 th Feb to 3 rd Mar	2	UNIT I -The Cell and General Physiology UNIT VI -- Blood Cells and Blood Coagulation	Hb estimation
6 th to 10 th Mar	3	UNIT I -- The Cell UNIT VI – The Blood	Blood groups
13 th to 17 th Mar	4	UNIT II – Membrane Physiology-Transport UNIT VI - Blood Cells, Immunity and Blood Coagulation	ESR
20 th to 24 th Mar	5	UNIT II – Membrane Potentials & Action Potentials UNIT VI - Blood Cells, Immunity and Blood Coagulation	Hemocytometer
27 th to 31 st Mar	6	UNIT II – Membrane Potentials & Action Potentials UNIT VI - Blood Cells, Immunity and Blood Coagulation	Red cell count
3 rd to 7 th Apr	7	UNIT II – Skeletal Muscle UNIT VI - Blood Cells, Immunity and Blood Coagulation	TLC
10 th to 14 th Apr	8	UNIT II – Skeletal Muscle UNIT VI - Blood Cells, Immunity and Blood Coagulation	Platelet count
17 th to 21 st Apr	9	UNIT II – Smooth Muscle UNIT VI - Blood Cells, Immunity and Blood Coagulation	DLC
24 th to 28 th	10	Eid ul fitr /sports week	
1 st to 5 th May	11	UNIT III – The Heart UNIT VII -- Respiration	BT & CT
8 th to 12 th May	12	UNIT III – The Heart UNIT VII -- Respiration	Spirometer

Dates-2023	Weeks	Lectures	Practicals
15 th to 19 th May	13	UNIT III – The Heart UNIT VII -- Respiration	ECG
22 nd to 26 th May	14	UNIT III – The Heart UNIT VII -- Respiration	Exam of precordium Exam of Resp System
30 th May to 2 nd Jun	15	UNIT III – The Heart UNIT VII -- Respiration	BP
5 th to 9t Jun	16	UNIT III – The Heart UNIT VII -- Respiration	Pulse
12 th to 15 th Jun	17	UNIT III – The Heart UNIT VII -- Respiration	Sensory Exam
19 th Jun to 14 th Jul	18 to 21	SUMMER VACATIONS	SUMMER VACATIONS
17 th to 21 st Jul	22	UNIT IV – The Circulation UNIT VI – The Body Fluids & Kidney	Reflexes
24 th to 28 th Jul	23	UNIT IV – The Circulation UNIT VI – The Body Fluids & Kidney	Cerebellum
31 st Jul to 4 th Aug	24	UNIT IV – The Circulation UNIT VI – The Body Fluids & Kidney	1, 3 rd , 4 th 6 th , 9 th , 10 th -12 th Cranial nerves

Dates-2023	Weeks	Lectures	Practicals
7 th to 11 th Aug	25	UNIT IV – The Circulation UNIT VI – The Body Fluids & Kidney	Perimetry
14 th to 18 th Aug	26	UNIT IV – The Circulation UNIT VI – The Body Fluids & Kidney	Visual acuity
21 st to 25 th Aug	27	UNIT IX—Sensory Physiology UNIT XII -- GIT	7 th , 5 th , cr. nerves
28 th to 31 st Aug	28	UNIT IX—Sensory Physiology UNIT XII -- GIT	8 th cranial nerves
4 th to 8 th Sep	29	UNIT IX— Sensory Physiology UNIT XII – GIT	Revision
11 th to 15 th Sep	30	UNIT XI – Sensory Physiology UNIT XIV -- Endocrinology	Revision
18 th to 22 nd Sep	31	UNIT XI – Motor Physiology UNIT XIV -- Endocrinology	Revision
25 th to 29 th Sep	32	UNIT XI – Motor Physiology UNIT XIV – Endocrinology	Revision
2 nd to 6 th Oct	33	UNIT XI – Motor Physiology UNIT XIV – Endocrinology	Revision
9 th to 13 th Oct	34	UNIT XI – Motor Physiology UNIT XIV – Endocrinology	Revision
16 th to 20 th Oct	35	UNIT XI – Motor Physiology UNIT X – Special Senses	Revision
23 rd to 27 th Oct	36	UNIT X – Special Senses Varied Environment	Revision
30th to 10th Nov	37-38	Term test/Prep Leaves	
	39	Send up	
	40	UHS Exam—Prep Leaves	

TEACHING METHODOLOGIES FOR PHYSIOLOGY

1. Interactive Lectures: for active involvement of students some engagement trigger like Brainstorming, Think, pair, and share, Buzz session, Q&A sessions.
2. Tutorials: set of instructions to complete a task, to an interactive problem-solving session
3. Small group discussions: active involvement by everyone especially shy and less articulate are encourage to contribute Students learn from each other and everyone gets more practice at expressing their ideas
4. Essential skills to be learned in skill lab: provide a safe and protected environment in which the learner can practice clinical skills before using them in real clinical settings, such as performance of CPR.
5. Power point presentations by students: delivering positive learning experiences. And excellent communication (written, oral, and listening) skills.
6. Practical performance to enhance theoretical and clinical concepts
7. Self-directed learning is the most vital part to solve problematic cases, go through different learning resources and discuss with peers and the faculty to clarify difficult concepts
8. Online teaching through Microsoft teams and Google classroom when required

ATTENDANCE REQUIREMENT FOR PHYSIOLOGY

1. Students are expected to attend all scheduled teaching sessions and examinations
2. Attendance in lectures, tutorials, and practical is mandatory. Absence from these sessions will make the students ineligible to sit the final summative assessment.
3. A minimum of 75 % attendance in the lectures & practical is mandatory to appear in the summative UHS examination
4. Attendance will be recorded through a log-in/log-out biometrics system
5. Absence due to illness must be certified appropriately by the General Physician

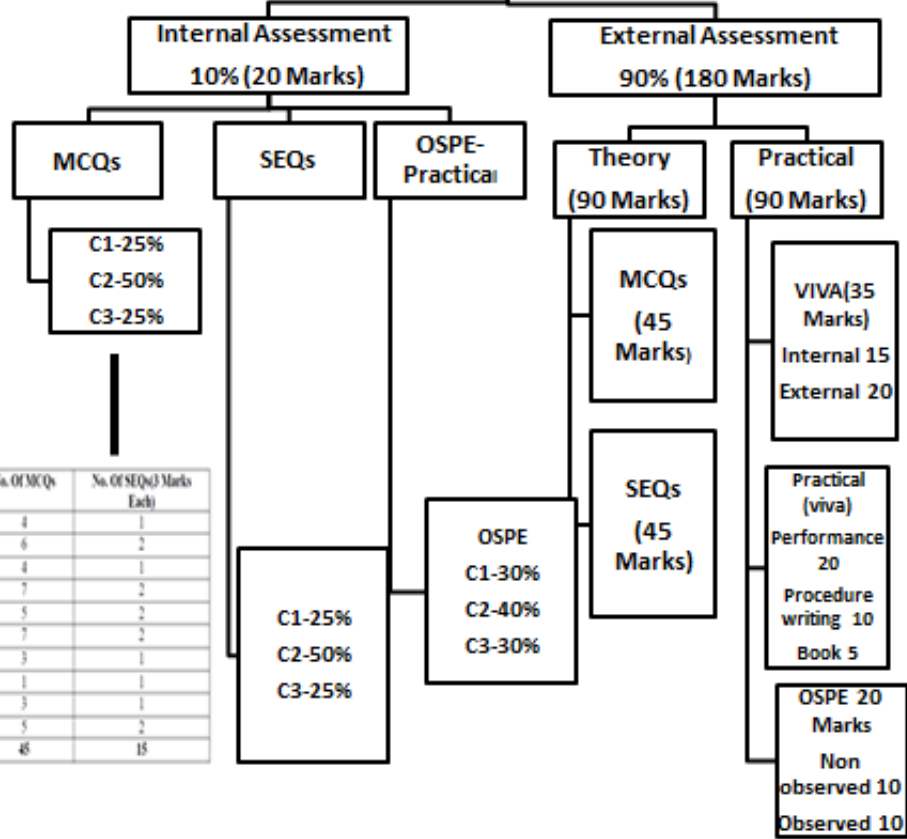
Weekly distribution of lectures and practicals

Monday	1:30 pm to 2:30 pm			
	Experimental Physiology lecture. Lecture Theater No. 10		Prof. Anser Prof. Uzma Prof. Zaima Dr. Attiqa (Associate Prof) Dr. Sadia (Associate Prof)	
Tuesday	8:am to 9:00am		10:30 am to 11:45 am	
	Experimental Physiology lecture. Lecture Theater No. 10		Physiology lecture. Lecture Theater No. 10	Prof. Anser Prof. Uzma Prof. Zaima Dr. Attiqa (Associate Prof) Dr. Sadia (Associate Prof)
Wednesday	12:45 pm to 1:30 pm			
	Experimental Physiology lecture. Lecture Theater No. 10		Prof. Anser Prof. Uzma Prof. Zaima Dr. Attiqa (Associate Prof) Dr. Sadia (Associate Prof)	
Thursday	11:00am to 12:30 pm		12:30 pm to 1:15 pm	
	Physiology practical Batch A Demonstrators 1 & 2		Exp/Physiology lecture Lecture Theater No. 10	Prof. Anser Prof. Uzma Prof. Zaima Dr. Attiqa (Associate Prof) Dr. Sadia (Associate Prof)
Friday	8:am to 8:45 am		9:30am to 11:00am	
	Experimental Physiology lecture. Lecture Theater No. 10	Prof. Anser Prof. Uzma Prof. Zaima Dr. Attiqa (Associate Prof) Dr. Sadia (Associate Prof)	Physiology practical Batch B Demonstrators 1 & 2	

TEST SCHEDULE 1st YEAR BDS (2023)

Test 1	24-03-2023
Test 2	17-04-2023
Test 3(Term test 1)	15-05-2023
Test 4	02-06-2023
Test 5	24-07-2023
Test 6 (Term test 2)	15-08-2023
Test 7	22-09-2023
Test 8	16-10-2023
Test 9(term test 3)	13-11-2023
Send up	-11-2023

Assessment Plan 1st Prof BDS



Topic Unit	No. Of MCQs	No. Of SEQs(3 Marks Each)
Basic & Cell Physiology	4	1
Nerve & Muscle	6	2
Renal Physiology	4	1
Blood Physiology	7	2
Respiration	5	2
Cns	7	2
Special Senses	3	1
GI	1	1
Endocrinology	3	1
Heart & Circulation	5	2
Total	45	15

ASSESSMENT METHODOLOGY

1. Formative

1a. Formal formative

1. Class tests
2. Send up
3. Viva—semi structured
4. Practical—OSPE

1b. Informal formative

1. Quizzes
2. Assignments
3. Class presentation/group discussions

2. Summative

UHS professional examination

Test Format

1. Theory: 1) Single best multiple choice questions. 2) Short essay question
2. Viva
3. Practical performance
4. OSPE (observed & non-observed stations)

Internal assessment policies

10% based upon the Departmental test and 90% UHS Professional Examination

TABLE OF SPECIFICATIONS (TOS) FOR BDS FIRST PROFESSIONAL EXAMINATION

UHS has approved the following table of specifications (TOS) for First Professional Annual Examination BDS:

For Theory Paper

Total time allocated = 03 Hours (Including MCQs)

Marks of theory paper = 90 (MCQs = 45 + SEQs = 45)

Internal assessment = 10

Total marks = 100

Pass Marks = 50

45 x MCQs (on separate sheet) (45 Marks) Time =50 min

15 x SEQs (on separate sheet) (45 Marks) Time = 2 hours & 10 min

Topic/Unit	No. Of MCQs	No. Of SEQs(3 Marks Each)
Basic & Cell Physiology	4	1
Nerve & Muscle	6	2
Renal Physiology	4	1
Blood Physiology	7	2
Respiration	5	2
Cns	7	2
Special Senses	3	1
Git	1	1
Endocrinology	3	1
Heart & Circulation	5	2
Total	45	15

For Practical Examination:

Practical examination marks = 90

Internal assessment = 10

Total marks = 100

Pass Marks = 50

Viva Voce (35 marks)

- Internal ----- 15 marks
- External ----- 20 marks

OSPE (20 marks)

- Non-observed stations 05 of 02 marks each (2 minutes each)
- Observed stations 02 of 05 marks each (4 minutes each)

Practical (35 marks)

- Practical Viva = 20 marks
- Procedure Writing = 10 marks
- Yearly Workbook Assessment = 05 marks

LEARNING RESOURCES

- 1. Departmental library**
- 2. IT library**
- 3. Recommended books**
- 4. Reference books**

RECOMMENDED BOOKS

- 1. Textbook of Physiology by Guyton and Hall, Latest Ed.**
- 2. Board Review Series by Linda S Costanzo**
- 3. Human Physiology from Cells to System by Lauralee Sherwood**
- 4. Guyton Review for MCQs**