Course- Human physiology & Biochemistry

Course code: Hom UG - PB

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1. PREAMBLE

Physiology studies the functional organization of man at several levels like atom, chemical, cells, tissues, organ systems and the whole body to understand fundamental mechanisms that operate in a living organism. The underlying goal is to explain the operations in a living organism.

Besides satisfying a natural curiosity about how humans function, the study of physiology is of central importance in medicine and related health sciences, as it underpins advances in our understanding of disease and our ability to treat it more effectively. It is also important from psychological and philosophical viewpoints, helping us to understand the different systems. Homoeopathic Philosophy postulates the force animating every cell as the Vital Force which helps in homoeostasis. When it is deranged due to web of causes, disease develops.

Homoeopath must understand Man in a holistic way which would help him to deliver the therapeutic action for the purpose of bringing about a cure. Understanding the structural organisation i.e., Anatomy along with psychological organisation go hand in hand. Their interplay maintains health and delivers optimum function for healthy living and progressing towards higher purpose as per Hahnemannian guidelines. Hence physiology needs to be integrated horizontally with Anatomy, Materia Medica, Organon of Medicine, Psychology & Pharmacy as well as vertically with Pathology, Surgery, Obstetrics &Gynaecology, Community Medicine, Practice of Medicine & Repertory for better grasp of health, disease and process of cure.

Advances in biochemical processes have been occurring at an astonishing pace. The action of homoeopathic medicines does occur at sub-cellular levels. Hence an in-depth understanding and correlation of the processes in health and disease can open up a whole new way of understanding Homoeopathic drugs and their far-reaching effects.

2. PROGRAMME OUTCOMES

At the end of BHMS program, a student must

1. Develop the competencies essential for primary health care in clinical diagnosis and treatment of diseases through the judicious application of homoeopathic principles

2. Recognize the scope and limitation of homoeopathy and to apply the Homoeopathic Principles for curative, prophylactic, promotive, palliative, and rehabilitative primary health care for the benefit of the individual and community.

3. Discern the relevance of other systems of medical practice for rational use of cross referral and life saving measures, so as to address clinical emergences

4. Develop capacity for critical thinking and research aptitude as required for evidence based homoeopathic practice.

5. Demonstrate aptitude for lifelong learning and develop competencies as and when conditions of practice demand.

6. Be competent enough to practice homoeopathy as per the medical ethics and professionalism.

7. Develop the necessary communication skills to work as a team member in various healthcare setting and contribute towards the larger goals of national policies such as school health, community health, environmental conservation.

8. Identify and respect the socio-demographic, psychological, cultural, environmental & economic factors that affect health and disease and plan homoeopathic intervention to achieve the sustainable development Goal.

2. Course Outcomes (COs):

At the end of the course the student will be able to:

1. Discuss the Homoeopathic concept of health in relation to integrated body structure and functions.
2. Explain the normal functioning of the human body at all levels of organization.
3. Relate the concept of homoeostasis with relevant ideas in Anatomy, Materia medica and Organon of Medicine at BHMS I level .
4. Elucidate the physiological aspects of normal growth and development with focus on evolution.
5. Correlate micro functions at cellular level with macro functions at organ-system level.
6. Use necessary communication skills required for history-taking of the patient & relating various clinical findings in the patient.
7. Perform experiments in haematology, clinical physiology & biochemistry as required for the study of physiological phenomena and for assessment of normal function.
8. Identify the normal values of haematology, clinical physiology & biochemistry.
9. Perform clinical – physiological examination under supervision.
10. Correlate knowledge of Organon & Materia Medica with Physiology.
11. Explain the integrated responses of the organ systems of the body to physiological and pathological stresses.

4. TEACHING HOURS

Sr No.	Subject	Theoretical Lecture	Practical / Tutorial / Seminar / Clinical Posting
01	PHYSIOLOGY & BIOCHEMISTRY	325 hrs.	330 hrs.

PER SEMESTER TOTAL HRS OF TEACHING

Lectures - 108	Non – Lecture – 110	Total - 218

PER WEEK TOTAL HRS OF TEACHING

Lectures – 7	Non – Lecture – 7	Total - 14

Theory Wise Teaching Hours Distribution – 325 Hours

Sr. No	**Paper-I**	
	List of System	**Teaching Hours**
1	General Physiology	20
2	Bio Physics Science	15
3	Skin & The Integumentary System	15
4	Body fluids & Immune mechanism	35
5	Nerve Muscle physiology	15
6	Cardiovascular system	20
7	Respiratory and Environmental Physiology	25
8	Renal Physiology	20
	Total	**165**
Sr. No	**Paper-II**	
	List of System	**Teaching Hours**
1	Central Nervous System	35
2	Endocrinology	30
3	Reproduction	15
4	Special Senses	20

5	Digestion and Nutrition	35
6	Biochemistry	25
	Total	**160**

Practical / Clinical Physiology / OPD Wise Teaching Hours Distribution – 330 Hours

Physiology – SEMESTER 1 : Practical – lab work			
No	**Practical**	**Demonstration / Performance**	**Number of Teaching Hours**
HAEMATOLOGY			
1	Study of the Compound Microscope	Performance	05
2.	Collection of Blood Samples	Performance	05
3	Estimation of Haemoglobin Concentration	Performance	05
4	Determination of Haematocrit	Demonstration	05
5	Hemocytometry	Performance	05
6	Total RBC Count	Performance	10
7	Determination of RBC Indices	Demonstration	05
8	Total Leucocytes Count (TLC)	Performance	10

9	Preparation And Examination Of Blood Smear	Performance	10
10	Differential Leucocyte Count (DLC)	Performance	10
11	Absolute Eosinophil Count	Demonstration	05
12	Determination of Erythrocyte Sedimentation Rate	Demonstration	05
13	Determination of Blood Groups	Performance	05
14	Determination of Bleeding Time and Coagulation Time	Performance	05
BIOCHEMISTRY			
1	Demonstration of Uses Of Instruments Or Equipment	Demonstration	05
2	Qualitative Analysis of Carbohydrates, Proteins And Lipids	Performance	10
3	Normal Characteristics of Urine	Performance	04
4	Abnormal Constituents of Urine	Performance	10
5	Quantitative Estimation of Glucose, Total Proteins, Uric Acid in Blood	Performance	05
6	Liver Function Tests	Demonstration	04
7	Kidney Function Tests	Demonstration	04
8	Lipid Profile	Demonstration	04
9	Interpretation and Discussion of Results of Biochemical Tests	Demonstration	04
	Total		**140**

CLINICAL PHYSIOLOGY			
1	Case Taking & Approach to pt	Performance	05
2	General Concept Of Examination	Performance	10
3	Examination of muscles, joints,	Performance	10
4	Cardio-Vascular System – Blood Pressure Recording, Radial Pulse, ECG, Clinical Examination	Performance	15
5	Nervous System- Clinical Examination	Performance	15
6	Respiratory System- Clinical Examination, Spirometry, Stethography	Performance	15
7	Special Senses- Clinical Examination	Performance	15
8	Reproductive System- Diagnosis of Pregnancy	Performance	05
9	Gastrointestinal System- Clinical Examination	Performance	10
	Total		**100**
OPD – APPLIED PHYSIOLOGY			
1	OPD (Applied Physiology)	Demonstration & Performance	90
	TOTAL		**90**

Semester Wise Distribution of Theory, Practical, Clinical Physiology & OPDs

Sr No./ Duration	Wk	Physiology	Total Hrs
SEMESTER - 1			
Module 1. Organization of the human body	**16 Wks**	• General physiology • Bio Physics Science • Skin & The integumentary System **Clinical Physiology :** • Case Taking & Approach to Patient • General concept of examination.	Lectures – 100 Hrs Non – Lectures – 115 Hrs.
Module 2 Principals of Support System & Movements with transportation		• Body Fluid & Immune Mechanism • Nerve Muscles Physiology **Practical :** • Study of the Compound Microscope • Collection of Blood Samples • Estimation of Haemoglobin Concentration • Determination of Haematocrit • Haemocytometry • Total RBC Count	

		• Determination of RBC Indices • Total Leucocytes Count (TLC) • Preparation And Examination Of Blood Smear • Differential Leucocyte Count (DLC) • Absolute Eosinophil Count • Determination of Erythrocyte Sedimentation Rate • Determination of Blood Groups • Determination of Bleeding Time and Coagulation Time **Clinical Physiology :** • Examination of muscles, joints,	
	4th Month – 5 days PA 6th Month – 10 days TT – including Viva Voce		
SEMESTER - 2			
Module 3. Vital Maintenance of the human body	**16 Wks**	• Cardiovascular System • Respiratory & Environmental Physiology **Clinical Physiology :-** • Cardio-Vascular System – Blood Pressure Recording, Radial Pulse, ECG, Clinical Examination • Respiratory System- Clinical Examination, Spirometry, Stethography • OPD (Applied Physiology)	Lectures – 110 Hrs Non – Lectures – 110 Hrs.
Module 4.		• Central Nervous System	

Control system of the human body with continuity		• Endocrinology **Clinical Physiology :** • Nervous System- Clinical Examination • Special Senses- Clinical Examination • Reproductive System – Diagnosis of pregnancy • OPD (Applied Physiology)	
	9th Month – 5 days PA 12th Month – 10 days TT – including Viva Voce		
SEMESTER - 3			
Module 5. **Energy maintenance of human body**	**16 wks**	• Reproductive System • Special Senses • Digestion System & Nutrition • Renal Physiology • Bio-Chemistry **Practical : -** • Demonstration of Uses Of Instruments Or Equipment • Qualitative Analysis of Carbohydrates, Proteins And Lipids • Normal Characteristics of Urine • Abnormal Constituents of Urine • Quantitative Estimation of Glucose, Total Proteins, Uric Acid in Blood	Lectures – 115 Hrs Non – Lectures – 105 Hrs.

		• Liver Function Tests • Kidney Function Tests • Lipid Profile • Interpretation and Discussion of Results of Biochemical Tests **Clinical Physiology :-** • Gastrointestinal System- Clinical Examination • OPD (Applied Physiology)	
	14th Month – 5 days PA 18th Month – 12 days TT – including Viva Voce – University exam		

5. COURSE CONTENT

1. The purpose of a course in physiology is to enable the students to learn the functions, processes and inter-relationship of the different organs and systems of the normal disturbance in disease so that the student is familiar with normal standards of reference while diagnosing deviations from the normal, and while treating the patients.
2. There can be no symptoms of disease without vital force animating the human organism and it is primarily the vital force which is maintaining state of health
3. Physiology shall be taught from the stand point of describing physical processes underlying them in health;
4. Applied aspect of every system including the organs is to be stressed upon while teaching the subject.
5. Correlation with Organon and philosophy especially the concept of health and its derangement the interplay of different cell, tissue organ and system, their representation in repertory and integration in HMM
6. There should be close co-operation between the various departments while teaching the different systems;

7. There should be joint courses between the two departments of anatomy and physiology so that there is maximum co-ordination in the teaching of these subjects;
8. Seminars should be arranged periodically and lecturers of anatomy, physiology and bio-chemistry should bring home the point to the students that the integrated approach is more meaningful.

THEORY:-

1. **GENERAL PHYSIOLOGY:**

   Introduction to cellular physiology

   Cell Junctions

   Transport through cell membrane and resting membrane potential Body fluids compartments

   Homeostasis

2. **BIO-PHYSICAL SCIENCES**

   Filtration Ultra-filtration Osmosis

   Diffusion Adsorption Hydrotropy, Colloid

   Donnan Equilibrium Tracer elements Dialysis

   Absorption Assimilation Surface tension

3. **SKIN &THE INTEGUMENTARY SYSTEM**

   Skin & Integumentary System

Layers of Skin

Function of Skin

Sweat

Body temperature and its regulation

4. BODY FLUID & IMMUNE MECHANISM

Blood

Plasma Proteins

Red Blood Cells

Erythropoiesis

Haemoglobin and Iron Metabolism

Erythrocyte Sedimentation Rate

Packed Cell Volume and Blood Indices

Haemolysis and Fragility of Red Blood Cells

White Blood Cell

Immunity

Platelets

Haemostasis

Coagulation of Blood

Blood groups

Blood Transfusion

Blood volume

Reticulo-endothelial System and Tissue Macrophage Lymphatic System and Lymph

Tissue Fluid and Oedema

5. **NERVE MUSCLE PHYSIOLOGY**

Physiological properties of nerve fibres

Nerve fibre- types, classification, function, Degeneration and regeneration of peripheral nerves

Neuro-Muscular junction

Physiology of Skeletal muscle

Physiology of Cardiac muscle

Physiology of Smooth muscle

EMG

6. **CARDIO-VASCULAR SYSTEM**

Introduction to cardiovascular system Properties of cardiac muscle

Cardiac cycle

General principles of circulation Heart sounds

Regulation of cardiovascular system

Normal and abnormal Electrocardiogram (ECG)

Cardiac output

Heart rate

Arterial blood pressure

Radial Pulse

Regional circulation- Cerebral, Splanchnic, Capillary, Cutaneous & skeletal muscle circulation.

Cardiovascular adjustments during exercise

7. RESPIRATORY SYSTEM AND ENVIRONMENTAL PHYSIOLOGY

Physiological anatomy of respiratory tract

Mechanism of respiration: Ventilation, diffusion of gases

Transport of respiratory gases Regulation of respiration Pulmonary Function Test

High altitude and space physiology Deep sea physiology

Artificial respiration

Effects of exercise on respiration

8. CENTRAL NERVOUS SYSTEM

Introduction to nervous system Neuron

Neuroglia

Receptors

Synapse

Neurotransmitters

Reflex

Spinal cord

Somato-sensory system and somato-motor system Physiology of pain

Brain stem, Vestibular apparatus

Cerebral cortex

Thalamus

Hypothalamus

Internal capsule

Basal ganglia

Limbic system

Cerebellum – Posture and equilibrium

Reticular formation

Proprioceptors

Higher intellectual function Electroencephalogram (EEG)

Physiology of sleep

Cerebro-spinal fluid (CSF) Autonomic Nervous System (ANS)

9. ENDOCRINOLOGY

Introduction of endocrinology and importance of PNEI axis Hormones and hypothalamo- hypophyseal axis

Pituitary gland

Thyroid gland

Parathyroid

Endocrine functions of pancreas Adrenal cortex

Adrenal medulla

Endocrine functions of other organs

10. REPRODUCTIVE SYSTEM

Male reproductive system-testis and its hormones; seminal vesicles, prostate gland, semen.

Introduction to female reproductive system

Menstrual cycle

Ovulation

Menopause

Infertility

Pregnancy and parturition Placenta

Pregnancy tests

Mammary glands and lactation Fertility

Foetal circulation

11. SPECIAL SENSES

Eye: Photochemistry of vision, Visual pathway, Pupillary reflexes, Colour vision, Errors of refraction

Ear: Auditory pathway, Mechanism of hearing, Auditory defects

Sensation of taste: Taste receptors, Taste pathways

Sensation of smell: Olfactory receptors, olfactory, pathways Sensation of touch

12. DIGESTIVE SYSTEM & NUTRITION

Introduction to digestive system

Composition and functions of digestive juices

Physiological anatomy of Stomach, Pancreas, Liver and Gall bladder, Small intestine, Large intestine

Movements of gastrointestinal tract

Gastrointestinal hormones

Digestion and absorption of carbohydrates, proteins and lipids

13. RENAL PHYSIOLOGY

Physiological anatomy of kidneys and urinary tract

Fluid & electrolyte with acid base balance need to be include

Renal circulation

Urine formation: Renal clearance, glomerular filtration, tubular reabsorption, selective secretion, concentration of urine, acidification ofurine

Renal functions tests

Micturition

14. BIO-CHEMISTRY THEORY

Carbohydrates: (Chemistry, Metabolism, Glycolysis, TCA, HMP, Glycogen synthesis and degradation, Blood glucose regulation)

Lipids: (Chemistry, Metabolism, Intestinal uptake, Fat transport, Utilization of stored fat,Activation of fatty acids, Beta oxidation and synthesis of fatty acids)

Proteins: (Chemistry, Metabolism, Digestion of protein, Transamination, Deamination Fate of Ammonia, Urea cycle, End products of each amino acid and their entry into TCA cycle

Enzymes: (Definition, Classification, Biological Importance, Diagnostic use, Inhibition)

Vitamins: (Daily requirements, Dietary source, Disorders and physiological role)

Minerals (Daily requirement, Dietary Sources, Disorders and physiological role) mineral metabolism

Organ function tests

PRACTICAL & CLINICAL PHYSIOLOGY:-

No	**Practical**	**Demonstration / Performance**
HAEMATOLOGY		

1	Study of the Compound Microscope	Performance
2.	Collection of Blood Samples	Performance
3	Estimation of Haemoglobin Concentration	Performance
4	Determination of Haematocrit	Demonstration
5	Hemocytometry	Performance
6	Total RBC Count	Performance
7	Determination of RBC Indices	Demonstration
8	Total Leucocytes Count (TLC)	Performance
9	Preparation And Examination Of Blood Smear	Performance
10	Differential Leucocyte Count (DLC)	Performance
11	Absolute Eosinophil Count	Demonstration
12	Determination of Erythrocyte Sedimentation Rate	Demonstration
13	Determination of Blood Groups	Performance
14	Determination of Bleeding Time and Coagulation Time	Performance
BIOCHEMISTRY		
1	Demonstration of Uses Of Instruments Or Equipment	Demonstration
2	Qualitative Analysis of Carbohydrates, Proteins And Lipids	Performance

3	Normal Characteristics of Urine	Performance
4	Abnormal Constituents of Urine	Performance
5	Quantitative Estimation of Glucose, Total Proteins, Uric Acid in Blood	Performance
6	Liver Function Tests	Demonstration
7	Kidney Function Tests	Demonstration
8	Lipid Profile	Demonstration
9	Interpretation and Discussion of Results of Biochemical Tests	Demonstration
CLINICAL PHYSIOLOGY & OPD		
1	Case Taking & Approach to pt	Performance
2	General Concept Of Examination	Performance
3	Examination of muscles, joints,	Performance
4	Cardio-Vascular System – Blood Pressure Recording, Radial Pulse, ECG, Clinical Examination	Performance
5	Respiratory System- Clinical Examination, Spirometry, Stethography	Performance
6	Nervous System- Clinical Examination	Performance
7	Special Senses- Clinical Examination	Performance
8	Reproductive System- Diagnosis of Pregnancy	Performance
9	Gastrointestinal System- Clinical Examination	Performance

10	OPD (Applied Physiology)	Demonstration & Performance

6. TEACHING LEARNING METHODS

Different teaching-learning methods must be apply for understanding holistic and integrated way of physiology. There has to be classroom lectures, small group discussions, case discussion where case based learning (CBL) and problem based learning (PBL). In the applied physiology, Case discussion (CBL-PBL) methods are helpful for students. AV – Methods for demonstration of physiological processes will be very helpful. In process of Clinical Physiology – DOAP (Demonstration – Observation – Assistance – Performance) is very well applicable.

Practical & Clinics are the best medium to demonstrate all physiological processes in objective ways. They help us to understand and explain the physiological signs. Haematological& Biochemistry practicals are done in laboratory, where one can apply the DOAP (Demonstration – Observation – Assistance – Performance) & OSPE (Objective Structured Practical Examination) methods. All this should be recorded in the journal.

In the clinics / OPD / IPD / Bed side there shall be exposure of Clinical & Applied Physiology. These can be demonstratedby DOAP (Demonstration – Observation – Assistance – Performance) & OSCE (Objective Structured Clinical Examination) methods. These methods are more objective, and t will help students to develop the attitude as clinicians.

Other Innovative methods include preparation of charts and models.

7. CONTENT MAPPING (COMPETENCY TABLE)

SEMESTER – 1

Topic No	**1**
Theory	**General Physiology**
Practical	**-**
Clinical Physiology	**Case Taking & Approach to Patient**

Learning Outcome: -

At the end of the chapter General Physiology, the student must be able to –

- Discuss the principles of cellular physiology.
- Classify cell junctions.
- Explain the process of transport through cell membrane
- Describe the resting membrane potential.
- Categorise body fluids compartments.
- Explain the concept of homeostasis

S.No	Generic competency	Subject area	Miller's Level	Specific competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration - Horizontal / Vertical / Spiral
HomUG-PB 1.1	Integration Of Information (K-1)	Introduction & Cell	Knows	Definition & general introduction	Define Physiology.	Cognitive	Level 1 (Remember/ recall)	Must know	Lecture, Small group discussion	MCQs	_	
HomUG-PB 1.2			Knows How		Discuss the importance of learning physiology in a homoeopathic course	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	Viva Voce	Organon
HomUG-PB 1.3			Knows How		Discuss the Internal & external environm	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

					ent of Body							
HomUG-PB 1.4	Integration Of Information (K-1)	Homeostasis	Knows How W	Describe and discuss the principles of homeostasis	Explain the regulation of internal environment	Cognitive	Level 2 Understand / interpret	Desirable to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Pathology Organon
HomUG-PB 1.5			Knows How		Explain homoeostasis & it's control	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	
HomUG-PB 1.6	Integration Of Information (K-1)	The Cellular Level Organisation	Knows How	Describe the structure and functions of a mammalian cell	Describe the structure of cell	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Pathology
HomUG-PB 1.7			Knows How		Describe the	Cognitive	Level 2	Must know	Lecture, Small group	SAQs	SAQs, Viva Voce	Pathology Organon

					functions of cell		Understand / interpret		discussion			
HomUG-PB 1.8			Knows		List the organelles present in cell	Cognitive	Level 1 (Remember/ recall)	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomUG-PB 1.9			Knows		Enumerate the functions of organelles	Cognitive	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Pathology
HomUG-PB 1.10			Knows		List the name of intracellular junction	Cognitive	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 1.11			Knows How		Discuss the importance of intracellul	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy

					ar Junction							
HomUG-PB 1.12	Integration Of Information (K-1)		Knows How	To understand transport mechanisms across cell membranes	Explain Passive transportation	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 1.13			Knows How		Explain Active Transportation	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 1.14			Knows How		Explain Vesicular Transportation	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 1.15	Information Gathering,	Clinical & Applied Physiology	Shows How	To conduct History taking	Demonstrate history	Affective	Level 1 Observe / Imitate	Must know	Demonstration, Role Play	Observation	DOPS	

	Integration Of information, Problem Integration (K-2)				taking process							

Topic No	**2**
Theory	**Bio Physics Science**
Practical	**-**
Clinical Physiology	**-**

Learning Objectives: -

At the end of the chapter Bio Physics Science, the student must be able to –

- Define biophysics.
- Illustrate the biophysical activity across the cell membrane.
- Explain membrane potential.
- Describe the chemical bond & solution.

S.No	Generic competency	Subject area	Miller's Level	Specific competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration -Horizontal / Vertical / Spiral
HomUG-PB 2.1	Integration Of Information (K-1)	Bio Physics Science	Knows	To understand the bio-Physical science of cell membrane	Define the terms Filtration& Ultrafiltration	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 2.2			Knows		Define intra cellular communication	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 2.3			Knows		Define the terms adsorption & Absorption	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 2.4			Knows		Define the terms Hydrotrophy,	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group	SAQs	SAQs, Viva Voce	Biochemistry Medicine

					Dialysis & Assimilation				discussion			
HomUG-PB 2.5			Knows		Define Surface Tension	Cognitive	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry Medicine
HomUG-PB 2.6	Integration Of Information (K-1)		Knows How	Discuss the Membrane Physiology &Membrane Potential	Explain Action Potential	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 2.7			Knows		Define Donnan Equilibrium	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 2.8			Knows		Define Transmembrane Potential	Cognitive	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry

HomUG-PB 2.9			Knows How		Explain nerve action potential	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 2.10			Knows		Define Tracer Elements	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 2.11			Knows		Define Rhythmicity of some excitable tissues	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 2.12	Integration Of Information (K-1)	The Chemical Level Organisation	Knows How	Understand the chemical bonds	Describe the Ionic Bond	Cognitive	Level 2 (Understand and interpret)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 2.13			Knows How		Describe the covalent bond	Cognitive	Level 2	Nice to know	Lecture, Small group	SAQs	SAQs, Viva Voce	Biochemistry

							Understand and interpret		discussion			
HomUG-PB 2.14			Knows How		Describe the Hydrogen Bond	Cognitive	Level 2 Understand and interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 2.15	Integration Of Information (K-1)		Knows	Understand the inorganic Compound & Solution	Define the terms Colloid, Solution & Suspension	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 2.16			Knows How		Discuss the characteristics of acids, Base & Salts	Cognitive	Level 2 Understand and interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 2.17			Knows How		Discuss acid - base balance & its	Cognitive	Level 2 (Understand)	Must know	Lecture, Small group	SAQs	SAQs, Viva Voce	Biochemistry

					application to the concept of pH				discussion			
HomU G-PB 2.18			Knows How		Describe the maintaining of pH: Buffer System	Cognitive	Level 2 (Understand)	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Biochemistry

Topic No	**3**
Theory	**Skin & The Integumentary System**
Practical	**-**
Clinical Physiology	**Demonstration of General Examination**

Learning Objectives: -

At the end of the chapter Skin & the Integumentary System, the student must be able to –

- Discuss the functions of skin, nail, and hair.

- Conduct examination of the Integumentary System under supervision.

S.No	Generic competency	Subject area	Miller's Level	Specific competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know/ desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration - Horizontal / Vertical / Spiral
HomUG-PB 3.1	Integration Of Information (K-1)	Skin & The Integumentary System	Knows How	Understand the Structure & function of Skin	Discuss layers of skin with their functions	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Medicine Organon Materia Medica Pharmacy
HomUG-PB 3.2			Knows How		Relate the structure of hair with its function	Cognitive	Level 2 Understand and interpret	Desirable To Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
HomUG-PB 3.3			Knows How		Relate the structure of	Cognitive	Level 2	Desirable To Know	Lecture, Small	SAQs	SAQs, Viva Voce	Anatomy

					nail with its function		Understand and interpret		group discussion			
HomUG-PB 3.4			Knows How		Relate the structure of different glands of skin with their functions	Cognitive	Level 2 (Understand)	Desirable To Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 3.5			Knows How		Describe the glands of skin	Cognitive	Level 2 Understand and interpret	Desirable To Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomUG-PB 3.6			Knows How		Explain the regulation of body temperature through skin	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine

HomUG-PB 3.7	Information Gathering , Integration Of information, Problem Integration (K-2)	Clinical & Applied Physiology	Shows How	To demonstrate General examination	Demonstrate the examination of Skin & Mucus Membrane	Psycho Motor	Level 1 Observe / Imitate	Must know	DOAP	Observation	OSCE	Medicine
MedicineHomUG-PB 3.8			Shows How		Demonstrate the examination of Conjunctive, Nail & Glands	Psycho Motor	Level 1 Observe / Imitate	Must know	DOAP	Observation	OSCE	Medicine

Topic No	**4**
Theory	**Nerve Muscle Physiology**
Practical	**-**
Clinical Physiology	**Demonstrate effect of mild, moderate and severe exercise and record changes in cardiorespiratory parameters** **Perform Ergography, Examination of muscles, joints,**

Learning Objectives: -

At the end of the chapter Nerve Muscle Physiology, the student must be able to –

- Discuss the properties and functions of neurons.
- Illustrate a neuromuscular junction.
- Classify muscle fibres.
- Describe the properties of skeletal, cardiac, and smooth muscle fibres.
- Demonstrate effect of mild, moderate and severe exercise and record changes in cardiorespiratory parameters.
- Perform Ergography under supervision.

S.No	Generic competency	Subject area	Miller's Level	Specific competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration - Horizontal / Vertical / Spiral
HomUG-PB 4.1	Integration Of Information (K-1)	Nerve Muscle Physiology	Knows	To understand the functional anatomy of Nerve fibres	Define Neurone Classify neurons	Cognitive	Level 1 (Remember/ recall)	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 4.2			Knows How		Explain structure and function of neuroglia	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy

HomUG-PB 4.3	Integration Of Information (K-1)		Knows	To understand the physiological properties of nerve fibers	Definethe terms Excitability & Conductivity	Cognitive	Level 1 (Remember/ recall)	Desirable To Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 4.4			Knows How		Discuss graded & action potential	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomUG-PB 4.5	Integration Of Information (K-1)		Knows How	To understand the degeneration & regeneration of neurone	Discuss the causes & grade of injury	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
HomUG-PB 4.6			Knows How		Identify the stages of degeneration	Cognitive	Level 2 Understand and interpret	Desirable To Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology

HomUG-PB 4.7			Knows How		Discuss the stages of regeneration	Cognitive	Level 2 Understand and interpret	Desirable To Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 4.8	Integration Of Information (K-1)		Knows How	To describe Neuromuscular Junction	Illustrate the Structure of Neuro-Muscular Junction	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 4.9			Knows How		Discuss the Neuromuscular Transmission	Cognitive	Level 2 Understand and interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 4.10			Knows How		Discuss Disorders of neuromuscular Junction	Cognitive	Level 2 (Understand)	Must know	Lecture, Small group discussion, CBL, PBL	MCQs	SAQs, Viva Voce	Medicine

HomUG-PB 4.11	Integration Of Information (K-1)		Knows How	To understand the physiological properties of Skeletal Muscle	Illustrate the mechanism of skeletal muscle contraction. Describe the general mechanism of muscle contraction.	Cognitive	Level 2 Understand and interpret	Desirable To Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 4.12			Knows How		Discuss Molecular mechanism	Cognitive	Level 2 Understand and interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 4.13			Knows How		Discuss Energetic of muscle contraction	Cognitive	Level 2 Understand and interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

HomUG-PB 4.14			Knows How		Discuss Excitation of skeletal muscle	Cognitive	Level 2 Understand and interpret	Desirable To Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 4.15	Integration Of Information (K-1)		Knows How	To understand the physiological properties of Smooth Muscle	Explain Contraction of smooth muscle	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 4.16			Knows How		Explain Nervous & hormonal control of smooth muscle contraction	Cognitive	Level 2 Understand and interpret	Desirable To Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 4.17	Integration Of Information (K-1)		Knows How	To understand the physiological properties	Illustrate Functional Anatomy of cardiac Muscle	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy

HomUG-PB 4.18			Knows How	of Cardiac Muscle	Explain process of excitability & contractility	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy
HomUG-PB 4.19			Knows How		Explain properties of cardiac muscle	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
HomUG-PB 4.20			Knows How		Discuss the disorders of Skeletal Muscles	Cognitive	Level 2 Understand and interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 4.21	Information Gathering, Integration Of informat	Clinical & Applied Physiology Of Muscle	Shows How	Demonstrate effect of mild, moderate and severe exercise and record	Measure the parameters of cardio-pulmonary changes during exercise	Psycho Motor	Level 2 Control	Nice to know	Demonstration	Observation	OSCE	Medicine

	ion, Problem Integration (K-2)			changes in cardiorespiratory parameters								
HomUG-PB 4.22			Shows How	Perform Ergography	Demonstrate the sequence of performing ergography.	Psycho Motor	Level 1 Observe / Imitate	Nice to know	Demonstration	Observation	OSCE	Medicine

Topic No	**5**
Theory	**Body Fluid& Immune Mechanism**
Practical	**Hematology**
Clinical Physiology	

Learning Objectives: -

At the end of the chapter on Body Fluid & Immune System & Hematology, the student must be able to –

- Describe the composition and functions of blood components

- Describe the origin, Forms, Variations and functions of plasma Protein
- Illustrate the synthesis of Haemoglobin
- Describe RBC formation (erythropoiesis) and its regulation
- Describe WBC formation (granulopoiesis) and its regulation
- Classify Anaemias & Jaundice
- Explain the role of lymphoid tissues in immune responses
- Classify different types of immunity
- Describe the development and regulation of immunity.
- Explain the formation and functions of platelets.
- Illustrate the physiological basis of haemostasis
- Describe different blood groups
- Discuss the clinical importance of blood grouping
- Describe blood transfusion
- Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT

S.No	**Generic competency**	**Subject area**	**Miller's Level**	**Specific competency**	**Specific Learning Objectives / outcomes**	**Bloom's domain**	**Guilbert's level**	**Must know / desirable to know / nice to know**	**TL method / media**	**Formative Assessment**	**Summative Assessment**	**Integration - Horizontal / Vertical / Spiral**
HomUG-PB 5.1	Integration Of	Blood Fluid and It's	Knows How	Describe the compositi	Discuss the composition of Blood	Cognitive	Level 2	Must know	Lecture, Small group	MCQs	LAQs, Viva Voce	

	Information (K-1)	Constituents		on and functions of blood components			Understand and interpret		discussion			
HomUG-PB 5.2			Knows How		Describe the function of blood	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 5.3			Knows		Define serum	Cognitive	Level 1 recall	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.4			Knows How		Explain the difference between serum & Plasma	Cognitive	Level 2 Understand and interpret	Desirable to Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Biochemistry

HomUG-PB 5.5	Integration Of Information (K-1)		Knows How	Describe the origin, Forms, Variations and functions of plasma Protein	Discuss the origin of plasma protein	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 5.6			Knows How		Explain the forms and functions of plasma proteins	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Pathology
HomUG-PB 5.7			Knows How		Identify the relation of diet to plasma protein	Cognitive	Level 2 Understand and interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.8	Integration Of Information (K-1)		Knows How	Describe and discuss the synthesis and	Illustrate the structure of Haemoglobin	Cognitive	Level 2 Understand and interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry

HomUG-PB 5.9			Knows How	functions of Haemoglobin	Discuss the synthesis of Haemoglobin	Cognitive	Level 2 Understand and interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 5.10			Knows		Define Normal function of Haemoglobin	Cognitive	Level 1 recall	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Biochemistry Materia Medica
HomUG-PB 5.11			Knows		State normal Value of different varieties of Haemoglobin	Cognitive	Level 1 recall	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
HomUG-PB 5.12			Knows How		Explain Iron metabolism	Cognitive	Level 2 Understand and interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry

HomUG-PB 5.13	Integration Of Information (K-1)		Knows How	Describe RBC formation (erythropoiesis & its regulation) and its functions	Discuss the normal structure of RBC with its morphology	Cognitive	Level 2 Understand and interpret	Desire to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Pathology Medicine
HomUG-PB 5.14			Knows How		discuss stages and regulation of erythropoiesis	Cognitive	Level 2 Understand and interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 5.15			Knows How		Discuss the fate of RBC	Cognitive	Level 2 Understand and interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.16			Knows How		Discuss the haemolysis	Cognitive	Level 2 Understand and interpret	Desirable to Know	Lecture, Small group discussion, CBL	SAQs	SAQs, Viva Voce	Medicine FMT

HomUG-PB 5.17	Information Gathering ,Integration Of information, Problem Integration (K-2)		Knows How	Describe different types of anaemias & Jaundice	Classify the anaemias according to their morphology & aetiology	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion, CBL, PBL	MCQs	LAQs, Viva Voce	Medicine, Pathology
HomUG-PB 5.18			Knows How		Discuss the different anaemia	Cognitive	Level 2 Understand / interpret	Desirable to know	Lecture, Small group discussion, CBL, PBL	MCQs	LAQs, Viva Voce	Medicine, Pathology Materia Medica Repertory
HomUG-PB 5.19			Knows How		Enumerate the different abnormal functions in anaemia	Cognitive	Level 2 Understand / interpret	Desirable to know	Lecture, Small group discussion, CBL, PBL	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 5.20			Knows How		Discuss the fate of bilirubin	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion, CBL	SAQs	SAQs, Viva Voce	Medicine, Pathology Materia Medica Repertory

HomUG-PB 5.21			Knows How		Explain Physiological Jaundice	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion, CBL	SAQs	SAQs, Viva Voce	Materia Medica Repertory
HomUG-PB 5.22			Knows How		Explain Jaundice in new-born	Cognitive	Level 2 Understand / interpret	Nice to Know	Lecture, Small group discussion, CBL	SAQs	SAQs, Viva Voce	Medicine Materia Medica Repertory
HomUG-PB 5.23	Integration Of Information (K-1)		Knows How	Describe WBC formation (granulopoiesis) and its regulation	Explain different condition of leucocyte count in our body	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine Pathology
HomUG-PB 5.24			Knows How		Classify different type of WBCs	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Pathology

HomUG-PB 5.25			Knows How		Discuss the function of WBCs as per their classification	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 5.26			Knows How		Discuss the phagocytosis	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
HomUG-PB 5.27			Knows How		Discuss the stages of leucopoiesis with its regulation	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.28			Knows How		Discuss the conditions that cause abnormal value of leucocyte	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Surgery Pathology

HomUG-PB 5.29	Integration Of Information (K-1)		Knows How	Describe the formation of platelets, functions and variations.	Discuss the structure & function of Platelets	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Pathology
HomUG-PB 5.30			Knows How		Describe the Thrombopoiesis	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.31			Knows How		Discuss its count & variation of platelets	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
HomUG-PB 5.32	Integration Of Information (K-1)		Knows How	Describe the physiological basis of	Describe the process of coagulation	Cognitive	Level 2 (Understand / interpret)	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Pathology Materia Medica

HomUG-PB 5.33			Knows How	haemostasis	Discuss the mechanism of haemostasis	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.34			Knows How		Explain stages of clotting mechanism	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Pathology Medicine
HomUG-PB 5.35	Integration Of Information (K-1)		Knows How	Describe the clinical importance of blood coagulation	Discuss haemorrhagic disorder	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion, CBL	MCQs	SAQs, Viva Voce	Medicine
HomUG-PB 5.36	Integration Of Information (K-1)		Knows	Describe different blood groups	Classify the ABO blood group system	Cognitive	Level 1 Recall	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology

HomUG-PB 5.37			Knows How		Discuss Landsteiner's Law	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.38	Integration Of Information (K-1)		Knows How	Discuss the clinical importance of blood grouping	Describe Rhesus Blood Group	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.39			Knows How		Discuss Rh Incompatibility	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine, Pathology Obstetrics & Gynaecology
HomUG-PB 5.40	Integration Of Information (K-1)		Knows How	Describe blood transfusion	Discuss the importance of Blood transfusion	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Surgery Medicine

HomUG-PB 5.41			Knows		List causes for Blood transfusion reaction	Cognitive	Level 1 Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.42	Integration Of Information (K-1)	Immune Mechanism	Knows How	Explain the role of lymphoid tissues in immune responses	Discuss Tissue Macrophage system	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology Medicine
HomUG-PB 5.43			Knows How		Describe the morphology and functions of Lymphocytes & Plasma cell	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
HomUG-PB 5.44			Knows How		Explain the functions of spleen	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

HomUG-PB 5.45			Knows How		Discuss the formation and functions of Lymph	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.46	Integration Of Information (K-1)		Knows	Define and classify different types of immunity.	Define Immunity	Cognitive	Level 1 (Remember/ recall)	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomUG-PB 5.47			Knows How		Explain different type of immunity	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	
HomUG-PB 5.48	Integration Of Information (K-1)		Knows How	Describe the development of immunity	Discuss development of immune response	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

HomUG-PB 5.49			Knows How	and its regulation	Discuss Autoimmunity & Hypersensitivity	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.50			Knows How		Discuss Immunodeficiency Diseases	Cognitive	Level 2 Understand / interpret	Desirable to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 5.51	Information Gathering ,Integration Of information, Problem Integration (K-2)	Haematology Practical	Shows How	Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT	Estimate Hb in the given sample	Psycho Motor	Level 2 (Control)	Must know	DOAP	Observation	Check list	Pathology Medicine
HomUG-PB 5.52			Knows How		Interpret results of Hb estimation	Cognitive	Level 2 Understand / interpret	Desirable to know	DOAP	Observation	Check list	Pathology Medicine

HomUG-PB 5.53			Shows How		Perform RBC Total Count Estimation	Psycho Motor	Level 2 (Control)	Must know	DOAP	Observation	Check list	Pathology
HomUG-PB 5.54			Knows How		Interpret the results of RBC Total Count Estimation	Cognitive	Level 2 Understand / interpret	Must know	DOAP	Observation	Check list	Pathology
HomUG-PB 5.55			Shows How		Perform WBC Total Count Estimation	Psycho Motor	Level 2 (Control)	Must know	DOAP	Observation	Check list	Pathology Medicine
HomUG-PB 5.56			Knows How		Interpret the results of WBC Total Count Estimation	Cognitive	Level 2 Understand / interpret	Must know	DOAP	Observation	Check list	Pathology Medicine
HomUG-PB 5.57			Shows How		Perform WBC DC estimation	Psycho Motor	Level 2 (Control)	Must know	DOAP	Observation	Check list	Pathology

HomUG-PB 5.58			Knows How		Interpret the results of WBC DC estimation	Cognitive	Level 2 Understand / interpret	Must know	DOAP	Observation	Check list	Pathology
HomUG-PB 5.59			Shows How		Record RBC indices	Psycho Motor	Level 2 (Control)	Must know	DOAP	Observation	Check list	Pathology Medicine
HomUG-PB 5.60			Knows How		Evaluate RBC indices	Cognitive	Level 2 Understand / interpret	Must know	DOAP	Observation	Check list	Pathology Medicine
HomUG-PB 5.61			Shows How		Perform Blood Group identification	Psycho Motor	Level 2 (Control)	Must know	DOAP	Observation	Check list	Pathology
HomUG-PB 5.62			Shows How		Perform BT / CT	Psycho Motor	Level 2 (Control)	Must know	DOAP	Observation	Check list	Pathology
HomUG-PB 5.63			Knows How		Interpret the results of BT / CT	Cognitive	Level 2	Must know	DOAP	Observation	Check list	Pathology

							Understand / interpret					
HomUG-PB 5.64			Shows How		Record ESR	Psycho Motor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Pathology
HomUG-PB 5.65			Knows How		Interpret the results of ESR estimation	Cognitive	Level 2 Understand / interpret	Must know	DOAP	Observation	Check list	Pathology
HomUG-PB 5.66	Information Gathering ,Integration Of information, Problem Integration (K-2)		Shows How	Describe steps for reticulocyte and platelet count	Record Reticulocyte count	Psycho Motor	Level 1 (Observe / Imitate)	Nice to know	Demonstration	Observation	Observation	Pathology
HomUG-PB 5.67			Knows How		Interpre the results of Reticulocyte count	Cognitive	Level 2 Understand / interpret	Must know	DOAP	Observation	Check list	Pathology Medicine
HomUG-PB 5.68			Shows How		Record Platelet Count	Psycho Motor	Level 1 (Observe / Imitate)	Nice to know	Demonstration	Observation	Observation	Pathology

HomU G-PB 5.69			Knows How		Interpret the results of Platelet Count	Cogniti ve	Level 2 Understan d / interpret	Must know	DOAP	Obser vation	Check list	Pathology Medicine

SEMESTER – 2

Topic No	**6**
Theory	**Cardio Vascular System**
Practical	
Clinical Physiology	**Cardio-Vascular System – Blood Pressure Recording, Radial Pulse, ECG, Clinical Examination**

Learning Objectives: -

At the end of chapter on Cardio Vascular System&itsexamination,the student must be able to –

- Describe the functional anatomy of the heart, with respect to its chambers, valves, input and output vessels, AV ring and electrical discontinuity, Conducting system, Coronary supply.
- Describe the properties of cardiac muscle including its morphology, electrical, mechanical and metabolic functions.
- Discuss the events occurring during the cardiac cycle
- Illustrate the hemodynamics of circulatory system

- Explain the regulation of cardiac output
- Describe the normal mode of conduction of the cardiac impulse
- Explain coronary, cerebral, capillary, pulmonary& splanchnic circulation
- List the major diseases of cardiovascular system,
- Record Pulse, blood pressure, and ECG
- Perform the clinical examination of cardiovascular system

S.No	Generic competency	Subject area	Miller's Level	Specific competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration - Horizontal / Vertical / Spiral
HomUG -PB 6.1	Integration Of Information (K-1)	Cardio Vascular System	Knows How	Describe the functional anatomy of heart including chambers, Sounds	Describe the chambers of heart	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Human Anatomy
HomUG -PB 6.2			Knows How		Discuss the valves & the walls of heart	Cognitive	Level 2Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Human Anatomy

HomUG-PB 6.3	Integration Of Information (K-1)		Knows How	Describe Pacemakertissueandconductingsystem.	Explain the pacemaker of heart.	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine – Cardiology
HomUG-PB 6.4			Knows How		Describe the conducting system	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
HomUG-PB 6.5	Integration Of Information (K-1)		Knows How	Describethe propertiesof cardiacmuscleincluding itsmorphology, electrical,mechanicalandmetabolicfunctions	Discuss the Morphological Properties of heart	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
HomUG-PB 6.6			Knows How		Discuss the electrical properties of heart	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 6.7			Knows How		Discuss the mechanical & metabolic	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group	SAQs	Viva Voce	Anatomy

					Properties of heart				discussion			
HomUG-PB 6.8	Integration Of Information (K-1)		Knows	Discussstheeventsoccuringduringthecardiaccycle	Define Cardiac cycle	Cognitive	Level 1 (Remember / recall)	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
HomUG-PB 6.9			Knows How		Discuss the events of cardiac cycle	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 6.10			Knows How		Explain the pressure changes during cardiac cycle	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 6.11			Knows How		Explain the ECG changes during each cardiac cycle	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine

HomUG-PB 6.12	Integration Of Information (K-1)		Knows	Discuss heart sounds	Define Heart Sound	Cognitive	Level 1 (Remember / recall)	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 6.13			Knows How		Explain different heart sounds with their measurement technique	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	
HomUG-PB 6.14			Knows How		Discuss the clinical importance of Murmurs& Triple heart sound	Cognitive	Level 2 Understand / interpret	Must know	Lecture, PBL, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Surgery
HomUG-PB 6.15	Integration Of Information (K-1)		Knows How	Describe the physiology of electrocardiogram (E.C.G),	Discuss normal ECG with it'swaves and intervals	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine

HomUG-PB 6.16			Knows How		Explain in electrocardiography with unipolar & bipolar recording.	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 6.17	Information Gathering ,Integration Of informationProblem Integration (K-2)		Knows How	Discussarrhythmia, heartblockandmyocardial Infarction	Classify arrythmias	Cognitive	Level 2 Understand / interpret	Must know	Lecture, PBL, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 6.18			Knows How		Explain Different degree of heart block. Explain Myocardial Infarction	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, PBL , Small group discussion	SAQs	SAQs, Viva Voce	Medicine Pathology Materia Medica Repertory
HomUG-PB 6.19	Integration Of Information (K-1)		Knows	Describehaemodynamicsofcirculatorysystem	List the functions of circulation	Cognitive	Level 1 Recall	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy

HomUG-PB 6.20			Knows		State the functions of heart	Cognitive	Level 1 Recall	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 6.21			Knows How		Discuss the pressure changes in vascular system	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomUG-PB 6.22			Knows		Recall the structure of the blood vessels	Cognitive	Level 1Recall	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Human Anatomy
HomUG-PB 6.23	Integration Of Information (K-1)		Knows How	Describethe factorsaffectingheartrate,	Identify the factors affecting heart rate and how it affects	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 6.24			Knows How		Discuss the mechanism	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group	SAQs	SAQs, Viva Voce	

					of control of heart rate				discussion			
HomUG-PB 6.25	Integration Of Information (K-1)		Knows	Describe the regulationofcardiacoutput	Define cardiac output	Cognitive	Level 1 (Remember / recall)	Must know	Lecture, Small group discussion	SAQs	LAQs Viva Voce	Materia Medica Repertory
HomUG-PB 6.26			Knows How		Discuss the distribution of cardiac output	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 6.27			Knows How		Discuss the factors affecting cardiac output	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 6.28			Knows How		Discuss in detail the Control mechanism of cardiac output	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

HomUG-PB 6.29	Integration Of Information (K-1)		Knows How	Understand the bloodpressure regulation	Discuss the importance of blood pressure	Cognitive	Level 2 Understand / interpret	Must know	Lecture, PBL, Smallgroup discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 6.30			Knows		State the factors affecting arterial blood pressure	Cognitive	Level 1 Recall	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 6.31			Knows How		Discuss the determinants of arterial blood pressure	Cognitive	Level 2 Understand / interpret	Desirable To Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 6.32			Knows How		Describe regulation of arterial blood pressure	Cognitive	Level 2 Understand / interpret	Must know	PBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine

HomUG-PB 6.33	Integration Of Information (K-1)		Knows How	Describe coronary, cerebral, capillary, pulmonary &splanchniccirculation	Discuss the capillary circulation	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 6.34			Knows How		Discuss the Coronary circulation	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Pathology
HomUG-PB 6.35			Knows How		Discuss the Cerebral circulation	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Pathology
HomUG-PB 6.36			Knows How		Discuss the Splenic circulation	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 6.37			Knows How		Discuss Pulmonary circulation	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group	SAQs	SAQs, Viva Voce	Medicine

									discussion			
HomUG-PB 6.38	Information Gathering ,Integration Of information,Problem Integration (K-2)		Knows How	Describethe mechanism of shock,syncope& Hypertension	Explain mechanism responsible for shock & syncope	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Pathology
HomUG-PB 6.39			Knows How		Discuss the mechanism of hypertension	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Pathology Materia Medica Organon
HomUG-PB 6.40	Information Gathering ,Integration Of information,Problem Integration (K-2)		Shows How	Recordblood dpressureat restandindifferentgrade sof exerciseand postures	Measure the blood pressure in resting &different grade of exercise	Psycho-motor	Level 2(Control)	Must know	Demonstration	Observation	Check list	Medicine
HomUG-PB 6.41			Knows How		Discuss the variation between	Cognitive	Level 2 (Understanding)	Must know	CBL, Lecture, Small	Observation	Check list	Medicine

					different blood pressure values after measuremen t				group discussio n			
HomU G-PB 6.42	Informatio n Gathering ,Integration Of informatio n, Problem Integration (K-2)		Show s How	Recordpuls eatrestandi ndifferentg radesof exerciseand postures	Measure pulse at rest and in different grades of exercise	Psycho-motor	Level 2 (Control)	Must know	Demonst ration	Observ ation	Check list	Medicine
HomU G-PB 6.43			Know s How		Discuss the variation between different arterial pulse value after measuremen t	Cognitiv e	Level 2 (Understan d)	Must know	CBL, Lecture, Small group discussio n	Observ ation	Check list	Medicine
HomU G-PB 6.44	Informatio n Gathering, Integration of		Show s How	Record ECG	Record ECG in a volunteer.	Psycho-motor	Level 2 (Control)	Desirable to know	Demonst ration	Observ ation	Check list	Medicine

	information, Problem Integration (K-2)		Knows		Identify the features of a normal ECG.	Cognitive	Level 1 (Recall)	Nice to Know	CBL, Lecture, Small group discussion			
HomUG-PB 6.45	Information Gathering,Integration Of information, Problem Integration (K-2)		Shows How	Demonstrat ethecorrect clinicalexa minationoft hecardiovas cular system	Locate the Apex beat	Psycho-motor	Level 2 (Control)	Must know	Demonst ration	Observ ation	Check list	Human Anatomy
HomUG-PB 6.46			Shows How		Auscultate forheart sound	Psycho-motor	Level 2 (Control)	Must know	Demonst ration	Observ ation	Check list	Medicine
HomUG-PB 6.47			Shows How		Identify different heart sounds	Psycho-motor	Level 2 (Control)	Must know	Demonst ration	Observ ation	Check list	Medicine

Topic No	**7**
Theory	**Respiratory & Environmental Physiology**
Practical	
Clinical Physiology	**Respiratory System- Clinical Examination, Spirometry, Stethography**

Learning Objectives: -

At the end of the chapter ofRespiratory & Environmental Physiology, the student must be able to –

- Describe the functional anatomy of respiratory tract.
- Describe the mechanics of normal respiration
- Describe pressure changes during ventilation
- Describe lung volume and capacities
- Describe the transport of respiratory gases
- Describe the regulation of respiration
- Demonstrate the correct clinical examination of the respiratory system in a normal volunteer.

S.No	Generic competency	Subject area	Miller's Level	Specific competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know /	TL method / media	Formative Assessment	Summative Asses	Integration - Horizontal / Vertical / Spiral

								nice to know			**smen t**	
Hom UG-PB 7.1	Integration Of Information (K-1)	Respiratory & Environmental Physiology	Knows How	Describethe functionalanatomyofrespiratorytract	Identify the different parts of upper respiratory tract	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 7.2			Knows How		Describe the importance of different parts of lower respiratory tract	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 7.3			Knows How		Identify the different parts oftracheo – bronchial tree, Respiratory membrane & pleura	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy

Hom UG-PB 7.4			Knows How		Explain the properties of Gases	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-PB 7.5			Knows How		Discuss non-respiratory function of respiratory system	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG-PB 7.6	Integration Of Information (K-1)		Knows How	Describethe mechanicsofnormalrespiration	Discuss the mechanism of Inspiration	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 7.7			Knows How		Discuss the mechanism of Expiration	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 7.8	Integration Of Information (K-1)		Knows How	Describe pressurechangesduring ventilation	Discuss intra-pulmonary pressure	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG-PB 7.9			Knows How		Discuss intra pleural pressure	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine

Hom UG-PB 7.10	Integration Of Information (K-1)		Knows How	Describe lungvolume andcapacities,	Discuss static lung volume & capacities	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
Hom UG-PB 7.11			Knows How		Discuss dynamic lung volume and capacities	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
Hom UG-PB 7.12	Integration Of Information (K-1)		Knows How	Describe alveolar surface tension	Define surface tension	Cognitive	Level 1 (Remember / recall)	Desirable To Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG-PB 7.13			Knows How		Discuss the significance of lung surfactant	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-PB 7.14	Integration Of Information (K-1)		Knows How	Describethe transport ofrespiratorygases	Describethe Oxygen transportation	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
Hom UG-PB 7.15			Knows How		Explainthe carbon dioxide transportation	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

Hom UG-PB 7.16	Information Gathering ,Integration Of information, Problem Integration (K-2)		Knows How	Describe the regulation of respiration	Discuss the nervous regulation of respiration	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
Hom UG-PB 7.17			Knows How		Discuss the Chemical regulation of respiration	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
Hom UG-PB 7.18			Knows How		Discuss the physio clinical aspect of Apnea	Cognitive	Level 2 Understand / interpret	Must know	PBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG-PB 7.19			Knows How		Discuss the physio clinical aspect of Dyspnoea, Asphyxia, Oxygen toxicity	Cognitive	Level 2 Understand / interpret	Must know	PBL, Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine FMT Materia Medica
Hom UG-PB 7.20	Information Gathering ,Integrati		Know	Describethe physio clinical aspect of	Define Hypoxia	Cognitive	Level 1 (Recall)	Must know	PBL, Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Medicine

Hom UG-PB 7.21	on Of information, Problem Integration (K-2)		Knows	hypoxia	Classify hypoxia. Define Cyanosis	Cognitive	Level 1Recall	Must know	PBL, Lecture, Small group discussion	MCQS, SAQs	SAQs, Viva Voce	Pathology Medicine
Hom UG-PB 7.22	Information Gathering ,Integration Of information, Problem Integration (K-2)		Knows How	Describe the principles and methods of artificialrespiration,	Discuss the principles of artificial respiration	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG-PB 7.23			Knows How		Discuss the Methods of artificial respiration	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG-PB 7.24	Integration Of Information (K-1)		Knows How	Describethe physiologyofhighaltitudeanddeepsea diving	Discuss the pressure changes during high altitude	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG-PB 7.25			Knows How		Discuss the effect during Rapid & slow ascent on high altitude	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

Hom UG-PB 7.26			Knows How		Discuss the pressure changes during Deep sea diving	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-PB 7.27	Information Gathering ,Integration Of information, Problem Integration (K-2)		Shows How	Performthec linicalexami nationofther espiratorysy steminanor malvolunte er	Perform the technique to assess normal respiratory rate, expansion of chest, in resting as well as exercise condition through inspection and palpation	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Medicine
Hom UG-PB 7.28			Shows How		Perform percussion on the chest	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Medicine

Hom UG-PB 7.29			Shows How		Perform the auscultation on different parts of lungs.	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Medicine

Topic No	**8**
Theory	**Central Nervous System**
Practical	
Clinical Physiology	**Nervous System- Clinical Examination**

Learning Objectives:-

At the end of chapter ofCentral Nervous System, the student must be able to –

- Map the organization of nervous system.
- State the functions and properties of synapse.
- Explain the functions and properties of receptors
- Describe the functions and properties of reflex.
- Discuss the mechanism of chemical transmission in the nervous system.
- Describe somatic sensations & sensory tracts.
- Describe and discuss motor tracts & mechanism of maintenance of muscle tone.
- Describe the physiology of vestibular apparatus, Control of body movements, posture and equilibrium.
- Describe structure and functions of autonomic nervous system
- Explain the functions, lesion & sensory disturbance of Spinal cord
- Describe functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system
- Describe behavioural and EEG characteristic during Sleep.
- Describe the physiological basis of memory, learning and speech
- Perform the clinical examination of the nervous system in a volunteer or on a simulator.

S.No	Generic competency	Subject area	Miller's Level	Specific competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration -Horizontal / Vertical / Spiral

HomUG-PB 8.1	Integration Of Information (K-1)	Nervous System	Knows	Describetheorganizationofnervoussystem	Identify the parts of central nervous system – brain & spinal cord with its function	Cognitive	Level 1Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 8.2			Knows How		Discuss the developmental aspect of central nervous system	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 8.3			Knows		Classify nervous system	Cognitive	Level 1Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 8.4	Integration Of Information (K-1)		Knows How	Describethefunctionsandpropertiesofsynapse.	Illustrate the physiological anatomy of synapse	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 8.5			Knows How		Discuss the electrical events	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group	SAQs	SAQs, Viva Voce	

					occurring at synapses				discussion			
HomUG-PB 8.6			Knows How		Discuss the properties of synapse.	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 8.7	Integration Of Information (K-1)		Knows	Describethefunctionsandpropertiesofreceptors	Define receptor	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
HomUG-PB 8.8			Knows		Classify the sensory receptors.	Cognitive	Level 1Recall	Desirable to Know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Anatomy
HomUG-PB 8.9			Knows How		Describe the Cutaneous receptor	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

HomUG-PB 8.10			Knows How		explain the properties of receptor	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 8.11	Integration Of Information (K-1)		Knows How	Describethefunctionsandpropertiesofreflex.	Discuss reflex arc	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 8.12			Knows		Classify reflexes	Cognitive	Level 1Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 8.13			Knows How		Discuss the properties of reflex	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 8.14	Integration Of		Knows	Describe the mechanism of chemical	Classify neurotransmitters	Cognitive	Level 1 Recall	Must know	Lecture, Small group	MCQs	SAQs, Viva Voce	Medicine

	Information (K-1)			transmission inthenervous system.					discussion			
HomUG-PB 8.15			Knows How		Explain the different types of neurotransmitter	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 8.16	Integration Of Information (K-1)		Knows	Describes omatic sensations & sensory tracts	Define sensory system	Cognitive	Level 1 (Remember / recall)	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 8.17			Knows How		Discuss different sensory tracts of spinal cord	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQ, Viva Voce	Anatomy
HomUG-PB 8.18			Knows How		Describethe sensory tracts of spinal cord	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine

HomUG-PB 8.19			Knows How		Explain the somato-sensory cortex	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine
HomUG-PB 8.20			Knows How		Explain the somatic sensation – touch, pressure, pain, temperature, proprioception	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion Demonstration	SAQs	SAQs, Viva Voce	Anatomy Medicine Materia Medica Repertory
HomUG-PB 8.21	Information Gathering ,Integration Of information, Problem		Knows How	Describe motor tracts & mechanism of maintenance of muscle tone	Discuss motor areas	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
HomUG-PB 8.22			Knows How		Discuss different motor tracts of spinal cord	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine

HomUG-PB 8.23	Integration (K-2)		Knows How		Discuss the motor tracts of spinal cord	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine
HomUG-PB 8.24			Knows How		Discuss the clinical significance of Motor tracts of spinal cord	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine Materia Medica
HomUG-PB 8.25	Information Gathering ,Integration Of information, Problem Integration (K-2)		Knows How	Describe the physiology of vestibular apparatus, Control ofbodymovements,posture and equilibrium	Discuss the physiological anatomy of vestibular apparatus	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Medicine
HomUG-PB 8.26			Knows How		Explain the functions of vestibular apparatus	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine Materia Medica
HomUG-PB 8.27			Knows How		Discuss the common	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group	SAQs	LAQs, Viva Voce	Medicine Materia Medica

					vestibular dysfunctions				discussion			
HomUG-PB 8.28	Integration Of Information (K-1)		Knows How	Describestructureandfunctions of autonomicnervoussystem(ANS)	Differentiate between somatic and autonomic nervous system	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 8.29			Knows How		Describe the divisions of Autonomic nervous system	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 8.30			Knows How		Discuss the responses of effector organ to autonomic nerve impulse	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 8.31	Information Gathering ,Integrati		Knows	Explain the functions,lesion&sensory disturbanc	List the functions of Spinal cord	Cognitive	Level 1Recall	Nice to know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine

HomUG-PB 8.32	on Of information, Problem Integration (K-2)		Knows How	e of Spinal cord	Illustrate the transection of spinal cord	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine, Surgery
HomUG-PB 8.33			Knows How		Describethe sensory disturbances of spinal cord	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 8.34	Information Gathering ,Integration Of information, Problem Integration (K-2)		Knows How	Describe functions of cerebral cortex, basal ganglia, thalamus, hypothalamus,cerebellum and limbic system and their abnormalities	Discuss the connections& functions of cerebral cortex	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine – Psychiatry Repertory
HomUG-PB 8.35			Knows How		Discuss the connections& functions of Basal Ganglia	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Medicine – Psychiatry Repertory
HomUG-PB 8.36			Knows How		Explain the connections& functions of Thalamus	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group	SAQs	SAQs, Viva Voce	Anatomy Medicine – Psychiatry

									discussion			Repertory
HomUG-PB 8.37			Knows How		Explain the connections& functions of Hypothalamus	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine – Psychiatry Materia Medica Repertory
HomUG-PB 8.38			Knows How		Discuss the connections& functions of Limbic system	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy, Psychology, Medicine – Psychiatry Materia Medica
HomUG-PB 8.39			Knows How		Explain the connections& functions of Cerebellum	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine – Psychiatry Materia Medica

HomUG-PB 8.40			Knows How		Explain the cerebellar lesions	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Pathology Medicine – Psychiatry Materia Medica Repertory
HomUG-PB 8.41	Integration Of Information (K-1)		Knows How	Describebehavioural and EEG characteristic during sleepand mechanismresponsibleforitsproduction	Discuss the importance of EEG	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 8.42			Knows How		Explain the Physiological Basis of EEG	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 8.43			Knows How		Discuss the factors affecting sleep	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine

HomUG-PB 8.44			Knows How		Describe the Physiological changes during sleep	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 8.45			Knows		Classify the types of sleep	Cognitive	Level 1Recall	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 8.46			Knows How		Discuss the factors controlling sleep cycle	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Medicine
HomUG-PB 8.47	Information Gathering ,Integration Of information, Problem		Knows How	Describethephysiologicalbasisofmemory,learning andspeech	Discuss the mechanism and development of speech	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Medicine
HomUG-PB 8.48			Knows How		Describe the physiological basis of learning	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group	SAQs	SAQs, Viva Voce	Anatomy Medicine Materia Medica

	Integration (K-2)								discussion			Repertory
HomUG-PB 8.49			Knows How		Discuss the physiological basis of memory.	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 8.50			Knows How		Discuss the applied physiology of memory	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Materia Medica Repertory
HomUG-PB 8.51	Information Gathering ,Integration Of information, Problem		Shows How	Perform theclinicale xamination ofthenervous system:Higherfunctions,sensory system,motorsystem, reflexes, cranialnerv	Perform examination of cranial nerves	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine
HomUG-PB 8.52			Shows How		Perform examination for speech	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine
HomUG-PB 8.53			Shows How		Conduct the assessment of muscle tone	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine

HomUG-PB 8.54	Integration (K-2)		Shows How	esinanormalvolunteerorsimulatedenvironment	Conduct the assessment of muscle power	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine
HomUG-PB 8.55			Shows How		Perform the clinical examination foe reflexes	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine
HomUG-PB 8.56			Shows How		Perform Cutaneous sensory examination	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine
HomUG-PB 8.57			Shows How		Perform the clinical examination of gait and posture	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine

Topic No	**9**
Theory	**Endocrine System**

Practical	
Clinical Physiology	**Reproductive System – Diagnosis of pregnancy**

Learning Objectives: -

At the end of chapter of Endocrine System & Diagnosis of pregnancy, the student must be able –

- Explain the mechanism of action of steroid, protein and amine hormones.
- Describe the regulation of secretion of hormones by hypothalamus.
- Discuss the synthesis, secretion, Transport, Physiological action, regulation & effect of altered secretion of-Pituitary gland; Thyroid gland; Para Thyroid glands; Adrenal glands; and Pancreatic Gland.
- Explain the physiology of Thymus &Pineal Glands, and the local hormones.

S.No	Generic competency	Subject area	Miller's Level	Specific competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration-Horizontal / Vertical / Spiral
HomU G-PB 9.1	Integration Of Information (K-1)	Endocrine system	Knows	Describethe mechanism ofactionofsteroid,protein	Define hormones	Cognitive	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

HomUG-PB 9.2			Knows How	andamineh ormones	Discuss the characteristic of hormones	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Psychology
HomUG-PB 9.3			Knows How		Classify the hormones as per their chemistry	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 9.4	Integration Of Information (K-1)		Knows How	Describe the regulation of secretion of hormones by hypothalamus	Discuss the regulation of hormone from the hypothalamus	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Medicine
HomUG-PB 9.5			Knows How		Discuss the homoeostatic mechanism of secretion of hormone through Hypothalamus	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine

HomUG-PB 9.6	Integration Of Information (K-1)		Knows How	Discuss the synthesis, secretion, Transport, Physiological action, regulation & effect of altered secretion of Pituitary gland	Discuss the physiological anatomy of pituitary gland	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Materia Medica
HomUG-PB 9.7			Knows How		Explain the secretion of anterior pituitary hormone	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Materia Medica
HomUG-PB 9.8			Knows How		Explain the secretion of growth hormone	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 9.9			Knows How		Describe the functions of growth hormone	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 9.10			Knows		List the factors affecting growth hormone	Cognitive	Level 1Recall	Nice to know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

HomUG-PB 9.11			Knows How		Discuss the effects of altered secretion of growth hormone	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine
HomUG-PB 9.12			Knows How		Explain the actions and control of secretion ofprolactin	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Obstetrics & Gynaecology
HomUG-PB 9.13			Knows How		Discuss the secretion of posterior Pituitary hormones	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 9.14			Knows How		Explain the functions of ADH	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 9.15			Knows How		Discuss the functions of Oxytocin	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine Obstetrics &

												Gynaecology
HomUG-PB 9.16			Knows How		Describe pituitary insufficiency	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Medicine
HomUG-PB 9.17	Integration Of Information (K-1)		Knows How	Describe the synthesis, secretion, Transport, Physiological action, regulation & effect of altered secretion of Thyroid gland	Discuss the physiological anatomy of Thyroid gland	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Materia Medica Repertory
HomUG-PB 9.18			Knows How		Describe the formation & secretion of thyroid hormone	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 9.19			Knows How		Explain the transport & metabolism of thyroid hormone	Cognitive	Level 2 Understand / interpret	Desirable to Know	CBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

HomUG-PB 9.20			Knows How		Discuss the regulation and action of thyroid hormone	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 9.21			Knows How		Explain the effect of altered secretion of Thyroid hormone	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 9.22	Integration Of Information (K-1)		Knows How	Explainthe synthesis, secretion, Transport, Physiological action, regulation & effect of altered secretion of Para Thyroid gland.	Discuss the calcium & phosphate metabolism	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry Medicine Materia Medica
HomUG-PB 9.23			Knows How		Discuss the action of parathormone	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 9.24			Knows How		Describe the action of Calcitonin	Cognitive	Level 2 Underst	Desirable to Know	Lecture, Small	SAQs	SAQs, Viva Voce	Biochemistry

							and / interpret		group discussion			
HomUG-PB 9.25			Knows How		Discuss the role ofCalcitonin in the maintenance of calcium homoeostasis in body	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Biochemistry Medicine Materia Medica
HomUG-PB 9.26			Calcitonin		Discuss the effect of altered secretion of para thyroid hormone	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 9.27	Integration Of Information (K-1)		Calcitonin	Describe the synthesis, secretion, Transport, Physiological action, regulation & effect of altered secretion of Adrenal gland	Discuss the physiological anatomy of Adrenal Cortex gland	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 9.28			Calcitonin		Describe the formation, secretion, and functions	Cognitive	Level 2 Understa	Must know	Lecture, Small	SAQs	LAQs, Viva Voce	

					of Glucocorticoid hormone		nd / interpret		group discussion			
HomUG-PB 9.29			Knows How		Describe the formation, secretion, and functions of Mineralocorticoid hormone	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 9.30			Knows How		Describe the formation, secretion, and functions of Sex hormones	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 9.31			Knows How		Explain the effects of altered secretion of Adrenal cortex hormone	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine

HomUG-PB 9.32			Knows How		Discuss the physiological anatomy of Adrenal Medullary gland	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 9.33	Integration Of Information (K-1)		Knows How	Describe the synthesis, secretion, Transport, Physiological action, regulation & effect of altered secretion of Pancreatic Gland	Explain the physiological anatomy of Pancreatic gland	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Materia Medica
HomUG-PB 9.34			Knows How		Discuss the action and regulation of Glucagon	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 9.35			Knows How		Discuss the action and regulation of Insulin	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine Materia Medica
HomUG-PB 9.36			Knows How		Describe the effects of altered secretion of	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Pathology Medicine

					Pancreatic Hormone							
HomUG-PB 9.37	Integration Of Information (K-1)		Knows How	Describethe physiology ofThymus& PinealGland	Describe the functions of hormone of thymus gland	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 9.38			Knows How		Discuss the functions of hormone of pineal gland	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 9.39			Knows How	Describe the Physiology of Local hormones	State the functions of Local hormones	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 9.40	Information Gathering ,Integration Of information, Problem		Shows How	Describe the diagnosis of pregnancy	Demonstrate the diagnosis of pregnancy through Urine pregnancy Strip	Psycho Motor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Obs&Gynec

	Integration (K-2)											

SEMESTER – 3

Topic No	**10**
Theory	**Reproductive System**
Practical	
Clinical Physiology	

Learning Objectives: -

At the end of the chapter onReproductive System, the student must be able to –

- Describe the onset, progression, and stages puberty.
- Describe the structure and functions of male reproductive system.
- Describe the physiological effects of male sex hormone.
- Describe female reproductive system & functions of ovary and its Control.
- Describe menstrual cycle with hormonal, uterine and ovarian changes.
- Describe the physiological effects of female sex hormones.
- Discuss the contraceptive methods for male and female.
- Discuss the physiology of pregnancy, parturition & lactation.

S.No	Generic competency	Subject area	Miller's Level	Specific competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration - Horizontal / Vertical / Spiral
HomUG-PB 10.1	Integration Of Information (K-1)	Reproductive System	Knows	Describe the onset, progression, and stages puberty.	Define puberty	Cognitive	Level 1 (Remember/ recall)	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Psychology Obstetrics & Gynaecology
HomUG-PB 10.2			Knows How	List causes and expressions of earlyand delayed puberty	Discuss the role of LH & FSH in development of puberty	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Psychology Obstetrics & Gynaecology
HomUG-PB 10.3			Knows How		Explain puberty for its onset, and stages. Describe the causes for delayed &	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Psychology Obstetrics & Gynaecology

					precocious puberty.							
HomUG-PB 10.4	Integration Of Information (K-1)		Knows How	Describe the structure and functions of malereproductive system.	Describe the structure of male reproductive system	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 10.5			Knows How		Explain the function of male reproductive system.	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 10.6	Integration Of Information (K-1)		Knows How	Describe the physiological effects of male sex hormone	Explain the functions of testis as an endocrine gland.	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs MCQs	SAQs, Viva Voce	Psychology Medicine
HomUG-PB 10.7			Knows How		Discuss the role of testosterone	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine Obstetrics & Gynaecology

HomUG-PB 10.8	Integration Of Information (K-1)		Knows How	Describe the functionsof testisandcontrolof spermatogenesis&factorsmodifyingit	Discuss the process of spermatogenesis	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy Medicine
HomUG-PB 10.9			Knows How		Discuss the factors affecting spermatogenesis	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 10.10	Integration Of Information (K-1)		Knows How	Describefemalereproductivesystem&functionsofovaryandits Control.	Describe structure the female reproductive tract	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Obstetrics & Gynaecology
HomUG-PB 10.11			Knows How		Discuss the functions of female reproductive tract	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Obstetrics & Gynaecology
HomUG-PB 10.12			Knows How		Discuss the role of ovary as an	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group	SAQs MCQs	LAQs, Viva Voce	Obstetrics & Gynaecology

					endocrine gland. List the hormones secreted by ovary.				discussion			
HomUG-PB 10.13	Integration Of Information (K-1)		Knows How	Describe menstrual cycle with hormonal,uterineandovarianchanges	Discuss the ovarian changes during menstrual cycle	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs MCQs	LAQs, Viva Voce	Obstetrics & Gynaecology
HomUG-PB 10.14			Knows How		Discuss the Uterine changes during menstrual cycle	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs MCQs	LAQs, Viva Voce	Obstetrics & Gynaecology
HomUG-PB 10.15			Knows How		Discuss the Vaginal changes during menstrual cycle	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Obstetrics & Gynaecology

HomUG-PB 10.16	Integration Of Information (K-1)		Knows How	Describethe physiological effectsof female sexhormones	Discuss the Gonadotrophin changes during menstrual cycle	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Obstetrics & Gynaecology Materia Medica
HomUG-PB 10.17			Knows How		Discuss the changes during menopause	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Obstetrics & Gynaecology
HomUG-PB 10.18			Knows How	Discuss thecontraceptivemethodsformaleandfemale.	Describe the contraceptive methods for male	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Obstetrics & Gynaecology Community Medicine
HomUG-PB 10.19			Knows How		Describe the contraceptive methods for female	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Obstetrics & Gynaecology Community Medicine

HomUG-PB 10.20	Integration Of Information (K-1)		Knows How	Discussthephysiologyof pregnancy, parturition & lactation.	Discuss the fertilization & implantation of ovum	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Obstetrics & Gynaecology
HomUG-PB 10.21			Knows How		Explain the role of placentaas an endocrine organ. List the placental hormones	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Obstetrics & Gynaecology
HomUG-PB 10.22			Knows How		Discuss the process of parturition	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Obstetrics & Gynaecology Materia Medica
HomUG-PB 10.23			Knows How		Describe the role of prolactin Hormone	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Obstetrics & Gynaecology

HomU G-PB 10.24			Know s How		Explain the process of lactation	Cognitive	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Obstetrics & Gynaecology Community Medicine Materia Medica

Topic No	**11**
Theory	**Special Senses**
Practical	
Clinical Physiology	**Special Senses – Clinical Examination**

Learning Objectives: -

At the end of the chapter on Special senses, the student must be able to –

- Discuss perception of smell and taste sensation
- Discuss patho-physiology of altered smell and taste sensation
- Discuss functional anatomy of ear and auditory pathways & physiology of hearing
- Discuss functional anatomy of eye, physiology of image formation, physiology of vision including colour vision, refractive errors, colour blindness, physiology of pupil and light reflex
- Discuss the physiological basis of lesion in visual pathway

- Demonstrate the testing of visual acuity, colour and field of vision; hearing; smell; and taste sensation in volunteer or simulated environment

S.No	Generic competency	Subject area	Miller's Level	Specific Competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method media	Formative Assessment	Summative Assessment	Integration - Horizontal / Vertical / Spiral
HomUG-PB 11.1	Integration Of Information (K-1)	Special Senses	Knows How	Describethe perception ofsmellsensation	Discuss the sensation of olfaction	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Surgery - ENT
HomUG-PB 11.2			Knows How		Discuss the olfactory receptor, olfactory pathway	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQ, Viva Voce	Anatomy
HomUG-PB 11.3			Knows How		Discuss the physiology of olfaction	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 11.4			Knows How		Discuss the altered	Cognitive	Level 2 Understan	Must know	CBL, Lecture, Small	MCQs	SAQs, Viva Voce	Medicine

					sensation of smell		d interpret		group discussion			
HomUG-PB 11.5	Integration Of Information (K-1)		Knows How	Describeperceptionof taste sensation	Discuss the sensation of Taste	Cognitive	Level 2 Understand interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Surgery – ENT Materia Medica Repertory
HomUG-PB 11.6			Knows How		Discuss the taste receptor.	Cognitive	Level 2 Understand interpret	Must know	Lecture, Small group discussion	SAQs	LAQ, Viva Voce	Anatomy
			Shows How		Draw the taste pathway	Psychomotor	Level 2 Control	Must Know	Demonstration	Observation	DOPS	Anatomy
HomUG-PB 11.7			Knows How		Discuss the physiology of Taste	Cognitive	Level 2 Understand interpret	Must to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 11.8			Knows How		Discuss the altered sensation of Taste	Cognitive	Level 2 Understand interpret	Desirabletoknow	CBL, Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine Materia Medica

HomUG-PB 11.9	Integration Of Information (K-1)		Knows How	Describe the functional anatomy of ear & auditory pathways	Describe the physiological anatomy of ear	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Surgery – ENT Materia Medica
HomUG-PB 11.10			Shows How		Map the Auditory Pathway	Psychomotor	Level 2 Control	Must Know	Demonstration	Observation	Check list	Anatomy ENT
HomUG-PB 11.11			Knows How		Describe the mechanism of hearing	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Surgery - ENT
HomUG-PB 11.12			Knows How		Discuss the altered sensation of Hearing	Cognitive	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine Surgery – ENT Materia Medica
HomUG-PB 11.13	Integration Of Information (K-1)		Knows How	Describe the functional anatomy of eye	Explain the structure & function of eye.	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Surgery - Ophthalmology

HomUG-PB 11.14	Integration Of Information (K-1)		Knows How	Describe the physiology of image formation	Describe the visual pathway	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 11.15			Knows How		Discuss the principles of optics, visual acuity, Visual reflex	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Surgery – Ophthalmology
HomUG-PB 11.16	Information Gathering ,Integration Of information, Problem Integration (K-2)		Knows How	Describe the physiology of vision including colour vision	Discuss the photochemistry of vision	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Surgery – Ophthalmology
HomUG-PB 11.17			Knows How		Discuss the photopic & scotopic vision	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Surgery – Ophthalmology
HomUG-PB 11.18			Knows How		Discuss the visual adaptation, visual accommodation & night blindness	Cognitive	Level 2 Understand / interpret	Desirable to know	PBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Surgery – Ophthalmology Materia Medica

HomUG-PB 11.19	Information Gathering ,Integration Of information, Problem Integration (K-2)		Knows How	Describe the refractive errors and colour blindness	Discuss the different types of refractive errors	Cognitive	Level 2 Understand / interpret	Desirable to know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Surgery – Ophthalmology Materia Medica Repertory
HomUG-PB 11.20			Knows How		Discuss the colour blindness	Cognitive	Level 2 Understand / interpret	Desirabletoknow	CBL, Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Surgery – Ophthalmology Materia Medica
HomUG-PB 11.21			Knows		List the causes of Nystagmus	Cognitive	Level 1Recall	Nice toknow	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Surgery – Ophthalmology Materia Medica
HomUG-PB 11.22	Information Gathering ,Integration Of information, Problem		Shows How	DemonstrateTestingofvisualacuity, colourandfieldofvision in a volunteer	Perform the testing of visual acuity, colour and field of vision	Psycho Motor	Level 2(Control)	Desirableto know	Demonstration	Observation	Check list	Surgery – Ophthalmology
HomUG-PB 11.23			Knows How		Interpret the testing of visual acuity,	Cognitive	Level 2 Understand / interpret	Nice to know	CBL, Lecture, Small	SAQs	SAQs, Viva Voce	Surgery – Ophthalmology

	Integration (K-2)				colour and field of vision				group discussion			Materia Medica
HomUG-PB 11.24	Information Gathering ,Integration Of information, Problem Integration (K-2)		Shows How	Demonstrate testing of hearing in a volunteer	Perform the testing of hearingin a volunteer	Psycho Motor	Level 2 (Control)	Nice to know	Demonstration	Observation	Check list	Surgery – ENT
HomUG-PB 11.25			Knows How		Interpret the testing of hearing in a volunteer	Cognitive	Level 2 Understand / interpret	Nice to know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Surgery – Ophthalmology Materia Medica
HomUG-PB 11.26	Information Gathering ,Integration Of information, Problem Integration (K-2)		Shows How	Demonstrate testingforsmellin a volunteer	Perform testing for smell in a volunteer	Psycho Motor	Level 2 (Control)	Nice to know	Demonstration	Observation	Check list	Surgery – ENT
HomUG-PB 11.27			Knows How		Interpret testing for smell in a volunteer	Cognitive	Level 2 Understand / interpret	Nice to know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Surgery – Ophthalmology Materia Medica

HomUG-PB 11.27	Information Gathering,Integration Of information, Problem Integration (K-2)		SHOW HOW	Demonstrate testingfortastesensationin volunteer	Perform testing for taste sensation in volunteer	Psycho Motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Surgery – ENT
HomUG-PB 11.29			Knows How		Interpret testing for taste sensation in volunteer	Cognitive	Level 2 Understand / interpret	Nice to know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Surgery – ENT

Topic No	**12**
Theory	**Digestive System & Nutrition**
Practical	**Liver Function Test**
Clinical Physiology	**Gastrointestinal system clinical examination**

Learning Objectives: -

At the end of the chapter Digestive system & Nutrition, the student must be able to –

- Describe the structure, Function & Innervation of digestive system.
- Describe the composition, mechanism of secretion, function & regulation of saliva.
- Describe the movement of oesophagus.
- Describe the composition, mechanism of secretion, function & regulation of gastric juice.
- Describe the composition, mechanism of secretion, function & regulation of pancreatic juice.

- Describe the structure & function of liver & Gall bladder.
- Describe the composition, mechanism of secretion, function & regulation of Bile.
- Describe the composition, mechanism of secretion, function & regulation of Small Intestine.
- Describe the movement of gastrointestinal tract, it's regulation & function.
- Describe the movement of large intestine & defecation as a process.
- Describe the physiology of digestion and absorption of nutrients.
- Observe the procedure for Liver Function Test.
- Perform examination for gastrointestinal system on a volunteer.

S.No	**Generic competency**	**Subject area**	**Miller's Level**	**Specific competency**	**Specific Learning Objectives / outcomes**	**Bloom's domain**	**Guilbert's level**	**Must know / desirable to know / nice to know**	**TL method / media**	**Formative Assessment**	**Summative Assessment**	**Integration - Horizontal / Vertical / Spiral**
HomUG-PB 12.1	Integration Of Information (K-1)	Digestive System & Nutrition	Knows How	Describe the structure, Function & Innervation of digestive system	Discuss the importance of digestive system	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 12.2			Knows		Recall the structure of digestive system	Cognitive	Level 1Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy

HomUG-PB 12.3			Knows		Recognise the structure of small intestine	Cognitive	Level 1Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 12.4			Knows		Identify the structure of large intestine	Cognitive	Level 1 Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 12.5	Integration Of Information (K-1)		Knows	Describe the composition, mechanism of secretion, function & regulation of saliva	Classify salivary glands. Mention the innervation of salivary glands.	Cognitive	Level 1Recall	Desirable to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Materia Medica
HomUG-PB 12.6			Knows How		Discuss composition of saliva	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Smallgroup discussion	MCQs	LAQs, Viva Voce	Biochemistry
HomUG-PB 12.7			Knows How		Discuss functions of saliva	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine Materia Medica

HomUG-PB 12.8			Knows How		Describe mechanism of salivary secretion	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 12.9			Knows How		Discuss the control of salivary secretion	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 12.10			Knows How		Explain the clinical relevance of salivary gland & salivary secretion	Cognitive	Level 2 Understand / interpret	Desirable to Know	PBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Materia Medica
HomUG-PB 12.11	Integration Of Information (K-1)		Knows How	Describe the movement of oesophagus	Describe the process of mastication.	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 12.12			Knows How		Explain the stages of swallowing	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Anatomy Medicine

HomUG-PB 12.13			Knows How		Discuss the role of upper & lower oesophageal sphincter	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 12.14			Knows		List the common oesophageal motility disorders	Cognitive	Level 1 Recall	Nice to Know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Surgery
HomUG-PB 12.15	Integration Of Information (K-1)		Knows	Describe the composition, mechanism of secretion, function & regulation of Gastric Juice	Recall the macro and micro structure of stomach	Cognitive	Level 1Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 12.16			Knows How		Discuss the functions of stomach	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
HomUG-PB 12.17			Knows How		Discuss the composition & functions of gastric juice	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Biochemistry

HomUG-PB 12.18			Knows How		Discuss the mechanism & regulation of gastric juice secretion	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 12.19			Knows How		Discuss the process of digestion in stomach	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 12.20			Knows How		Discuss the movements of stomach	Cognitive	Level 2 Understand / interpret	Desirable to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 12.21			Knows		Mention the three phases of vomiting	Cognitive	Level 1Recall	Nice to know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Materia Medica Repertory
HomUG-PB 12.22	Integration Of Information (K-1)		Knows	Describe the composition, mechanism	Recall the macro and micro structure of Pancreas	Cognitive	Level 1Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy

HomUG-PB 12.23			Knows How	of secretion, function & regulation of Pancreatic Juice	Discuss the composition & functions of pancreatic juice	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Biochemistry
HomUG-PB 12.24			Knows How		Discuss the mechanism & regulation of pancreatic juice secretion	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 12.25			Knows How		Describe exocrine pancreatic insufficiency	Cognitive	Level 2 Understand / interpret	Desirable to Know	CBL, Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine Materia Medica Repertory
HomUG-PB 12.26	Integration Of Information (K-1)		Knows How	Describe the structure & function of liver & Gall bladder	Discuss the structure & functions of Liver	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 12.27			Knows How		Explain the signs of liver insufficiency	Cognitive	Level 2 Understand / interpret	Desirable to Know	CBL, Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine

HomUG-PB 12.28			Knows How		Describe the structure & functions of gall bladder	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Repertory
HomUG-PB 12.29	Integration Of Information (K-1)		Knows How	Describe the composition, mechanism of secretion, function & regulation of Bile	Discuss the composition & function of liver bile	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 12.30			Knows How		Discuss the composition & function of gall bladder bile	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Biochemistry
HomUG-PB 12.31			Knows How		Describe the control & mechanism of bile secretion	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 12.32			Knows How		Describe the clinical significance of liver functions.	Cognitive	Level 2 Understand / interpret	Desirable to know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Materia Medica

HomUG-PB 12.33			Knows How		Describe the clinical significance of Gall Bladder functions	Cognitive	Level 2 Understand / interpret	Desirable know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Surgery
HomUG-PB 12.34	Integration Of Information (K-1)		Knows	Describe the composition, mechanism of secretion, function & regulation of Small intestine	Recognise the macro and micro structure ofSmall intestine	Cognitive	Level 1Recall	Desirable to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Repertory
HomUG-PB 12.35			Knows How		Discuss the composition & functions of Succus Entericus	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Biochemistry
HomUG-PB 12.36			Knows How		Discuss the mechanism & regulation of secretions of Succus Entericus	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

HomUG-PB 12.37			Knows How		Describe the process of digestion in small intestine	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 12.37			Knows How		Describe the Malabsorption Syndrome	Cognitive	Level 2 Understand / interpret	Nice to Know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Materia Medica
HomUG-PB 12.39	Integration Of Information (K-1)		Knows How	Describe the movement of gastrointestinal tract, it's regulation & function.	Explainperistalsis as intestinal movement	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Materia Medica
HomUG-PB 12.40			Knows How		Describe segmentation as intestinal movement	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 12.41			Knows How		Discuss the clinical importance of small intestine	Cognitive	Level 2 Understand / interpret	Desirable to Know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine

HomUG-PB 12.42	Integration Of Information (K-1)		Knows How	Describe the movement of large intestine & defecation as a process.	Discuss the movements of large intestine	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 12.43			Knows How		Describe the process of absorption &secretion in large intestine	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Materia Medica
HomUG-PB 12.44			Knows How		Discuss the process of defecation	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Repertory
HomUG-PB 12.45			Knows How		Discuss the clinical significance of large intestine	Cognitive	Level 2 Understand / interpret	Desirable to know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomUG-PB 12.46	Integration Of Information (K-1)		Knows How	Describe the physiology of digestion and	Discuss the digestion & absorption of carbohydrates	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

HomUG-PB 12.47			Knows How	absorption of nutrients	Discuss the digestion & absorption of Fats	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 12.48			Knows How		Discuss the digestion & absorption of Proteins	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs SAQs	LAQs, Viva Voce	
HomUG-PB 12.49			Knows How		Discuss absorption of water, electrolytes	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomUG-PB 12.50			Knows How		Describe the absorption of vitamins & minerals	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomUG-PB 12.51	Information Gathering ,Integration Of information, Problem		Shows How	Observe the process of conducting liver function test	Observe the liver function test	Psycho Motor	Level 1 (Observe / Imitate)	Nice to know	Demonstration	Observation	Checklist	Medicine

	Integration (K-2)											
HomUG-PB 12.52	Information Gathering ,Integration Of information, Problem Integration (K-2)		Shows How	Demonstrate the Gastrointestinal system examination	Perform the inspection of gastrointestinal system in the clinical examination	Psycho Motor	Level 2(Control)	Desirable to know	Demonstration	Observation	Checklist	Anatomy Medicine
HomUG-PB 12.53			Knows How		Interpret the findings of inspection of gastrointestinal system in clinical examination	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy Medicine
HomUG-PB 12.54			Shows How		Perform the palpation of gastrointestinal system in the clinical examination	Psycho Motor	Level 2 (Control)	Desirable to know	Demonstration	Observation	Checklist	Anatomy Medicine
HomUG-PB 12.55			Knows Ho		Interpret the findings of palpation of gastrointestinal system in	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy Medicine

					clinical examination							
HomUG-PB 12.56			Shows How		Perform the percussion of gastrointestinal system in the clinical examination	Psycho Motor	Level 2 (Control)	Desirable to know	Demonstration	Observation	Checklist	Anatomy Medicine
HomUG-PB 12.57			Knows Ho		Interpret the findings of percussion of gastrointestinal system in clinical examination	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy Medicine
HomUG-PB 12.58			Shows How		Perform the auscultation of gastrointestinal system in the clinical examination	Psycho Motor	Level 2 (Control)	Desirable to know	Demonstration	Observation	Checklist	Anatomy Medicine
HomUG-PB 12.59			Knows How		Interpret the findings of auscultation	Cognitive	Level 2 Understa	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy Medicine

					of gastrointestinal system in clinical examination		nd / interpret					

Topic No	**13**
Theory	**Renal Physiology**
Practical	**Kidney Function Test**
Clinical Physiology	

Learning Objectives: -

At the end of the chapterRenal Physiology, the student must be able to –

- Describe structure & functions of the kidneys.
- Explain the role of renin-angiotensin system.
- Describe the mechanism of urine formation.
- Describe the process of filtration, secretion & reabsorption in kidney.
- Describe the concentration and diluting mechanism in the kidney.
- Describe the renal regulation of acid-base balance.
- Describe the physiology of micturition.
- Describe the Renal Function Tests.

S.No	Generic competency	Subject area	Miller's Level	Specific Competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration - Horizontal / Vertical / Spiral
HomUG-PB 13.1	Integration Of Information (K-1)	Renal Physiology	Knows	Describe structure & functions of the kidneys.	Recognise the structure of kidney & nephron	Cognitive	Level 1Recall	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Materia Medica
HomUG-PB 13.2			Knows How		Discuss the functions of kidney	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 13.3			Knows How		Discuss the organization and function of glomerulus	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Medicine
HomUG-PB 13.4			Knows		Classify the type of nephrons	Cognitive	Level 1Recall	Must Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy

HomUG-PB 13.5			Knows How		Describe the structure and functions of juxtaglomerular apparatus	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
HomUG-PB 13.6	Integration Of Information (K-1)		Knows How	Explain the role of renin – angiotensin system	Explain the secretions from juxtaglomerular apparatus & their regulation	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 13.7	Integration Of Information (K-1)		Knows How	Describe the mechanism of urine formation	Explain the process of glomerular filtration	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 13.8			Knows How		Describe the regulation of Glomerular Filtration Rate	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 13.9			Knows How		Discuss the mechanism of GFR.	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group	SAQs	LAQs, Viva Voce	

					Explain the factors affecting GFR				discussion			
HomUG-PB 13.10	Integration Of Information (K-1)		Knows How	Describe the process of filtration, secretion & reabsorption in kidney	Discuss the general considerations of reabsorption & secretion	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Medicine Biochemistry
HomUG-PB 13.11			Knows How		Describe the renal transport mechanisms throughout the tubular segments	Cognitive	Level 2 Understand / interpret	Desirable to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 13.12			Knows How		Describe the transport of individual substances in different segments of renal tubule	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	

HomUG-PB 13.13	Integration Of Information (K-1)		Knows How	Describe the concentration and diluting mechanism in the kidney	Discuss the general consideration of urine concentration mechanism	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomUG-PB 13.14			Knows How		Describe the counter current multipliers	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Biochemistry
HomUG-PB 13.15			Knows How		Discuss the counter current exchangers	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomUG-PB 13.16	Information Gathering ,Integration Of information, Problem Integration (K-2)		Knows How	Describe the renal regulation of acid – base balance	Discuss the renal regulation of acid-base balance	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Biochemistry
HomUG-PB 13.17			Knows How		Describe the buffer system in the kidney	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry

HomUG-PB 13.18	Integration Of Information (K-1)		Knows	Describe the physiology of micturition	Define micturition	Cognitive	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 13.19			Knows How		Discuss the nerve supply of urinary bladder	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
HomUG-PB 13.20			Knows How		Describe the micturition reflex	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
HomUG-PB 13.21	Information Gathering ,Integration Of information, Problem Integration (K-2)		Shows How	Describe the Kidney function teste	Perform the physical, chemical, and microscopical examination of urine	Psycho Motor	Level 2 (Control)	Must know	Demonstration	Observation	OSCE	Biochemistry
HomUG-PB 13.22			Knows How		Recognise the normal values of physical, chemical,	Cognitive	Level 2 Understand / interpret)	Must know	Lecture, Small group	SAQs	LAQ, Viva Voce	Biochemistry

					and microscopical examination of urine				discussion			
HomUG-PB 13.23			Shows How		Perform examination for the abnormal constituents of urine	Psycho Motor	Level 3 (Control)	Must know	Demonstration	Observation	Checklist	Biochemistry Medicine
HomUG-PB 13.24			Knows How		Interpret the results of examination for the abnormal constituents of urine	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQ, Viva Voce	Biochemistry Medicine
HomUG-PB 13.25			Knows How		Interpret the renal clearance test for glomerular function	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQ, Viva Voce	Biochemistry Medicine
HomUG-PB 13.26			Knows How		Interpret the renal clearance test for	Cognitive	Level 2 Understan	Must know	Lecture, Small group	SAQs	LAQ, Viva Voce	Biochemistry Medicine

					Tubular function.		d / interpret		discussio n			

Topic No	**14**
Theory	**Biochemistry**
Practical	**Biochemistry Practical of carbohydrate, lipid, protein, Urine normal & abnormal constituents**
Clinical Physiology	

Learning Objectives: -

At the end of the chapter Biochemistry, the student must be able to –

- Describe the lipid, carbohydrate, and proteinmetabolisms.
- Describe the enzymes and their activities.
- Describe the role of Vitamins.
- Perform the quantitative estimation of Glucose, Total Proteins, Uric Acid in Blood.
- Perform the Lipid Profile.

S.No	Generic competency	Subject area	Miller's Level	Specific Competency	Specific Learning Objectives / outcomes	Bloom's domain	Guilbert's level	Must know / desirable to know / nice to know	TL method / media	Formative Assessment	Summative Assessment	Integration - Horizontal / Vertical / Spiral

HomUG-PB 14.1	Integration Of Information (K-1)	Biochemistry	Knows How	Describe the lipid Metabolism.	Explain the biosynthetic and catabolic pathways	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.2			Knows How		Explain the importance of lipids in the body.	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.3			Knows How		Explain the different properties of lipids.	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.4	Integration Of Information (K-1)		Knows How	Describe the Carbohydrate metabolism	Discuss different types of carbohydrates.	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.5			Knows		List major functions of carbohydrates.	Cognitive	Level 1Recall	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.6			Knows How		Discuss the food sources of	Cognitive	Level 2 Understa	Desirable to Know	Lecture, Small	SAQs	SAQs, Viva Voce	

					carbohydrates.		nd / interpret		group discussion			
HomUG-PB 14.7			Knows How		Explain the processes of glycolysis	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 14.8			Knows How		Explain the process of gluconeogenesis	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 14.9			Knows How		Describe the process of ATP production through oxidative phosphorylation	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.10	Integration Of Information (K-1)		Knows How	Describe the Protein Metabolism	Discuss the special features of protein Metabolism	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

HomUG-PB 14.11			Knows How		Discuss the functions of intact amino acid	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.12			Knows How		Discuss the oxidation of amino acid	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomUG-PB 14.13			Knows How		Discuss the synthesis of proteins	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Physiology
HomUG-PB 14.14			Knows How		Discuss the function of nitrogenous part	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.15			Knows How		Discuss the exogenous & endogenous protein metabolism	Cognitive	Level 2 Understand / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.16	Integration Of		Knows How	Describe the enzymes	Discuss the concept of enzyme,	Cognitive	Level 2 Understa	Nice to know	Lecture, Small	SAQs	SAQs, Viva Voce	Physiology

	Information (K-1)			and their activities.	chemical reactions, catalyst and substrates.		nd / interpret		group discussion			
HomUG-PB 14.17			Knows		Mentionthe major functions of enzymes.	Cognitive	Level 1Recall	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Physiology
HomUG-PB 14.18			Knows How		Discuss the importance of enzymes in the body.	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Physiology
HomUG-PB 14.19	Integration Of Information (K-1)		Knows	Describe the role of Vitamins	Define vitamin	Cognitive	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Physiology Community Medicine
HomUG-PB 14.20			Knows		Classify vitamins	Cognitive	Level 1Recall	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.21			Knows		Mentioncommon vitamin deficiencies		Level 1Recall	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Physiology Medicine

												Community Medicine
HomUG-PB 14.22	Information Gathering , Integration Of information, Problem Integration (K-2)		Knows	Demonstration of Uses Of Instruments Or Equipment	List the use of different instruments in biochemistry experiments	Cognitive	Level 1 Recall	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomUG-PB 14.23			Shows How	Demonstrate the Qualitative Analysis of Carbohydrates, Proteins And Lipids	Perform the qualitative analysis of carbohydrate	Psycho Motor	Level 2 (Control)	Must Know	Demonstration	Observation	Check list	Pathology
HomUG-PB 14.24			Knows How		Interpret the results of Qualitative analysis of carbohydrate	Cognitive	Level 2 Understand / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
HomUG-PB 14.25			Shows How		Observe the qualitative analysis of Protein	Psycho Motor	Level 1 (Observe / Imitate)	Desirable to Know	Demonstration	Observation	Check list	Pathology
HomUG-PB 14.26			Knows How		Interpret the results of Qualitative	Cognitive	Level 2 Understand / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology

					analysis of Protein							
HomUG-PB 14.27			Shows How		Perform the qualitative analysis of Lipid	Psycho Motor	Level 2 (Control)	Nice to Know	Demonstration	Observation	Check list Check list	Pathology
HomUG-PB 14.28			Knows How		Interpret the results of Qualitative analysis of Lipid	Cognitive	Level 2 Understand / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
HomUG-PB 14.29	Information Gathering ,Integration Of information, Problem Integration (K-2)		Shows How	Perform the quantitative estimation of Glucose, Total Proteins, Uric Acid in Blood	Perform the Quantitative estimation of glucose	Psycho Motor	Level 3 (Automatism)	Must Know	Demonstration	Observation	Check list	Pathology
HomUG-PB 14.30			Knows How		Interpret the results of Qualitative analysis of glucose	Cognitive	Level 2 Understand / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
HomUG-PB 14.31			Shows How		Perform the Quantitative estimation of	Psycho Motor	Level 3 (Automatism)	Must Know	Demonstration	Observation	Check list	Pathology

					Total proteins							
HomUG-PB 14.32			Knows How		Interpret the results of Qualitative analysis of total protein	Cognitive	Level 2 Understand / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
HomUG-PB 14.33			Shows How		Observe the Quantitative estimation of Uric Acid	Psycho Motor	Level 1 (Observe / Imitate)	Nice to Know	Demonstration	Observation	Check list	Pathology
HomUG-PB 14.34			Knows How		Interpret the results of Quantitative estimation of Uric acid	Cognitive	Level 2 Understand / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
HomUG-PB 14.35			Shows How	Perform the Lipid Profile	Observe the laboratory testing for Lipid profile	Psycho Motor	Level 1 (Observe / Imitate)	Must Know	Demonstration	Observation	OSCE	Pathology
HomUG-PB 14.36			Knows How		Interpret the results of Lipid profile testing done	Cognitive	Level 2 Understand / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology

					in a laboratory							

8. PRACTICAL TOPICS

PRACTICAL & CLINICAL PHYSIOLOGY:-

No	**Practical**	**Demonstration / Performance**
HAEMATOLOGY		
1	Study of the Compound Microscope	Performance
2.	Collection of Blood Samples	Performance
3	Estimation of Haemoglobin Concentration	Performance
4	Determination of Haematocrit	Demonstration
5	Hemocytometry	Performance
6	Total RBC Count	Performance
7	Determination of RBC Indices	Demonstration

8	Total Leucocytes Count (TLC)	Performance
9	Preparation And Examination Of Blood Smear	Performance
10	Differential Leucocyte Count (DLC)	Performance
11	Absolute Eosinophil Count	Demonstration
12	Determination of Erythrocyte Sedimentation Rate	Demonstration
13	Determination of Blood Groups	Performance
14	Determination of Bleeding Time and Coagulation Time	Performance
BIOCHEMISTRY		
1	Demonstration of Uses Of Instruments Or Equipment	Demonstration
2	Qualitative Analysis of Carbohydrates, Proteins And Lipids	Performance
3	Normal Characteristics of Urine	Performance
4	Abnormal Constituents of Urine	Performance
5	Quantitative Estimation of Glucose, Total Proteins, Uric Acid in Blood	Performance
6	Liver Function Tests	Demonstration
7	Kidney Function Tests	Demonstration
8	Lipid Profile	Demonstration
9	Interpretation and Discussion of Results of Biochemical Tests	Demonstration

CLINICAL PHYSIOLOGY & OPD		
1	Case Taking & Approach to pt	Performance
2	General Concept Of Examination	Performance
3	Examination of muscles, joints,	Performance
4	Cardio-Vascular System – Blood Pressure Recording, Radial Pulse, ECG, Clinical Examination	Performance
5	Respiratory System- Clinical Examination, Spirometry, Stethography	Performance
6	Nervous System- Clinical Examination	Performance
7	Special Senses- Clinical Examination	Performance
8	Reproductive System- Diagnosis of Pregnancy	Performance
9	Gastrointestinal System- Clinical Examination	Performance
10	OPD (Applied Physiology)	Demonstration & Performance

9. ASSESSMENT

PHYSIOLOGY THEME TABLE

PAPER – 1

Theme*	Topics	Term	Marks	MCQ's	SAQ's	LAQ's
A	General Physiology	I	07	Yes	Yes	No
B	Biophysics Science	I	07	Yes	Yes	No
C	Body fluids& Immune Mechanism	I	16	Yes	Yes	Yes
D	Cardiovascular system	II	16	Yes	Yes	Yes
E	Respiratory system	II	16	Yes	Yes	Yes
F	Excretory system	III	16	Yes	Yes	Yes
G	Skin & The Integumentary System	I	11	Yes	Yes	No
H	Nerve Muscle physiology system	I	11	Yes	Yes	No

PAPER – 2

Theme*	Topics	Term	Marks	MCQ's	SAQ's	LAQ's
A	Endocrine system	II	21	Yes	Yes	Yes
B	Central Nervous System	II	21	Yes	Yes	Yes

C	Digestive system and Nutrition	III	21	Yes	Yes	Yes
D	Reproductive system	III	17	Yes	Yes	Yes
E	Sense organs	III	12	Yes	Yes	Yes
F	Biochemistry	III	08	Yes	Yes	No

QUESTION PAPER BLUE PRINT

UNIVERSITY EXAM PAPER-I – 100 MARKS

MCQs – 10 Marks. **SAQs – 50 Marks.** **FAQs – 40 Marks**

Question Serial Number	**Type of Question**	**Question Paper Format (Refer Theme table for themes)**

Q1	Multiple choice Questions (MCQ) 10 Questions 1 mark each All questions compulsory	1. Theme A 2. Theme A 3. Theme B 4. Theme B 5. Theme C 6. Theme D 7. Theme E 8. Theme F 9. Theme G 10. Theme H
Q2	Short answer Questions(SAQ) All questions compulsory 5 Marks Each	1. Theme A 2. Theme B 3. Theme C 4. Theme D 5. Theme E 6. Theme F 7. Theme G 8. Theme G 9. Theme H 10. Theme H
Q3	Long answer Questions (LAQ) All questions compulsory 10 marks each	1. Theme C 2. Theme D 3. Theme E 4. Theme F

UNIVERSITY EXAM PAPER-II – 100 MARKS

MCQs – 10 Marks. SAQs – 50 Marks. FAQs – 40 Marks

Question Serial Number	**Type of Question**	**Question Paper Format** **(Refer Theme table for themes)**
Q1	Multiple choice Questions (MCQ) 10 Questions 1 mark each All questions compulsory	1) Theme A 2) Theme B 3) Theme C 4) Theme D 5) Theme D 6) Theme E 7) Theme E 8) Theme F 9) Theme F 10) Theme F
Q2	Short answer Questions (SAQ) All questions compulsory 5 Marks Each	1) Theme A 2) Theme A 3) Theme B 4) Theme B 5) Theme C 6) Theme C 7) Theme D

		8) Theme D 9) Theme E 10) Theme F
Q3	Long answer Questions (LAQ) All questions compulsory 10 marks each	1) Theme A 2) Theme B 3) Theme C 4) Theme E

Distribution of Marks for Practical Exam:

Practical Exam: 100 Marks	
Hematology	20 marks
Bio-chemistry	20 marks
Clinical Physiology	20 marks
Spotters	30 marks
Journal	10 marks
Viva: 80 Marks	

Viva Voce	80 marks
Internal Assessment: 20	
IA	20

The Pass Marks in Each Component of the Examination shall be 50%.

10. LIST OF RECOMMENDED BOOKS

THEORY

TEXT BOOKS

1. John N A (2023) Chatterjee C C. Text Book of Physiology 14th Edition. CBS Publication. (CBDC based)
2. Tortora G (2020). Principles of Anatomy & Physiology. Wiley Publication.
3. Jain A (2021). Text Book of Physiology Vol – 1 & 2. Avichal Publishing Company.
4. Glynn M (2022). Hutchion's Clinical Method, Elsevier Publication.
5. Reddy L P (2023) Fundamentals of Medical Physiology. CBS Publishers and Distributors(CBDC based)

REFERENCE BOOKS

1. Hall J. (2020). Guyton & Hall Text book of Medical Physiology. Elsevier Publication.
2. Khurana I (2021). Essential Medical Physiology. Elsevier Publication.

PRACTICAL & CLINICAL PHYSIOLOGY:-

1. Varshney VP, Bedi M, (2019) Practical Physiology: A Student's Workbook. 1st Edition. Jaypee Brothers Medical Publisher
2. Varshney VP, Bedi M, (2023) Ghai's Textbook of Practical Physiology: 10th Edition. Jaypee Brothers Medical Publisher (CBDC based)
3. John N Aet al (2021) C C Chatterjee's Manual of Practical Physiology:CBS Pubklishers and Distributors(CBDC based)

4. Jain A. (2019) Manual of Practical Physiology. 6th ed. Arya Publications.
5. Glynn M., William D. (2017). Hutchison's Clinical methods. 24th edition Elsevier Publication

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