

Teaching & Evaluation Scheme:	Human Physiology & Biochemistry
Semester/Year:	First Year B.H.M.S.
Program Name:	Bachelor of Homoeopathic Medicine and Surgery
Effective from Academic Year:	2022-23
Subject Code:	HomUG-PB

Human Physiology & Biochemistry

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 emergencies
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, and 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.

3. 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
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PER WEEK TOTAL HRS OF TEACHING

Lectures – 7	Non – Lecture – 7	Total - 14
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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	<u>Practical</u>	<u>Demonstration / Performance</u>	<u>Number of Teaching Hours</u>
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	<u>Interpretation and Discussion of Results of Biochemical Tests</u>	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,	
		4 th Month – 5 days PA 6 th 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. Control system of the human body with continuity		- Central Nervous System - Endocrinology Clinical Physiology : - Nervous System- Clinical Examination - Special Senses- Clinical Examination - Reproductive System – Diagnosis of pregnancy - OPD (Applied Physiology)	
	9 th Month – 5 days PA 12 th 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:-

GENERAL PHYSIOLOGY: Introduction to cellular physiology Cell Junctions

Transport through cell membrane and resting membrane potential Body fluids compartments Homeostasis

1. BIO-PHYSICAL SCIENCES

Filtration Ultra-filtration Osmosis Diffusion Adsorption Hydrotropy, Colloid
Donnan Equilibrium Tracer elements Dialysis Absorption Assimilation Surface tension

2. SKIN & THE INTEGUMENTARY SYSTEM

Skin & Integumentary System
Layers of Skin Function of Skin Sweat
Body temperature and its regulation

3. 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

4. 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

5. 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

6. 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

7. 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)

8. 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

9. 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

10. 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

11. 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

12. 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 of urine Renal functions tests

Micturition

13. 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:-

<u>No</u>	<u>Practical</u>	<u>Demonstration</u>
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	<u>Interpretation and Discussion of Results of Biochemical Tests</u>	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 demonstrated by DOAP (Demonstration – Observation – Assistance – Performance) & OSCE (Objective Structured Clinical Examination) methods. These methods are more objective, and it 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 environment	Cognitive	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

					ent of Body							
Hom UG- PB 1.4	Integrati on Of Informat ion (K- 1)	Homeost asis	Knows How W	Describe and discuss the principles of homeosta sis	Explain the regulation of internal environm ent	Cognitive	Level 2 Understan d / interpret	Desirable to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine Pathology Organon
Hom UG- PB 1.5			Knows How		Explain homoeost asis & it's control	Cognitive	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	MCQs	LAQs, Viva Voce	
Hom UG- PB 1.6	Integrati on Of Informat ion (K- 1)	The Cellular Level Organisa tion	Knows How	Describe the structure and functions of a mammali an cell	Describe the structure of cell	Cognitive	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Anatomy Pathology
Hom UG- 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			
Hom UG-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	
Hom UG-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
Hom UG-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
Hom UG-PB 1.11			Knows How		Discuss the importance of intracellular	Cognitive	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy

					ar Junction							
Hom UG- PB 1.12	Integrati on Of Informat ion (K- 1)		Knows How	To understan d transport mechanis ms across cell membran es	Explain Passive transport ation	Cognitive	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Biochemistr y
Hom UG- PB 1.13			Knows How		Explain Active Transport ation	Cognitive	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Biochemistr y
Hom UG- PB 1.14			Knows How		Explain Vesicular Transport ation	Cognitive	Level 2 Understan d / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Biochemistr y
Hom UG- PB 1.15	Informati on Gathering ,	Clinical & Applied Physiolo gy	Shows How	To conduct History taking	Demonstr ate history	Affective	Level 1 Observe / Imitate	Must know	Demonst ration, Role Play	Obser vation	DOPS	

	Integration Of information, Problem Integration (K-2)				taking process							
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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
HomU G-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
Hom UG-PB 2.2			Knows		Define intracellular communication	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomU G-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
HomU G-PB 2.4			Knows		Define the terms Hydro trophy,	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group	SAQs	SAQs, Viva Voce	Biochemistry Medicine

					Dialysis & Assimilation				discussion			
HomU G-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
HomU G-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
HomU G-PB 2.7			Knows		Define Donnan Equilibrium	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry
HomU G-PB 2.8			Knows		Define Transmembrane Potential	Cognitive	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistry

HomU G-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	
HomU G-PB 2.10			Knows		Define Tracer Elements	Cognitive	Level 1 (Remember/ recall)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
HomU G-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	
Hom UG- PB 2.12	Integrati on Of Informat ion (K- 1)	The Chemica l Leve l Organisa tion	Knows How	Understan d the chemical bonds	Describe the Ionic Bond	Cognitive	Level 2 (Understand and interpret)	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistr y
Hom UG- PB 2.13			Knows How		Describe the covalent bond	Cognitive	Level 2	Nice to know	Lecture, Small group	SAQs	SAQs, Viva Voce	Biochemistr y

							Understand and interpret		discussion			
HomU G-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
HomU G-PB 2.15	Integrati on Of Informat ion (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
HomU G-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
HomU G-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			
Hom UG- PB 2.18			Knows How		Describe the maintaining of pH: BufferSystem	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
HomU G-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
HomU G-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
HomU G-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			
HomU G-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
HomU G-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	
HomU G-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

Hom UG- PB 3.7	Information Gathering, Integration Of information	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
Medicine Hom UG-PB 3.8	Information, Problem Integration (K-2)		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
Hom UG-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
Hom UG-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

Hom UG-PB 4.3	Integrati on Of Informat ion (K-1)		Knows	To understand the physiological properties of nerve fibers	Definethe terms Excitability & Conductivity	Cogniti ve	Level 1 (Remember/ recall)	Desirable To Know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	
Hom UG-PB 4.4			Knows How		Discuss graded &action potential	Cogniti ve	Level 2 Understand and interpret	Must know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	
Hom UG-PB 4.5	Integrati on Of Informat ion (K-1)		Knows How	To understand the degenerat ion &	Discuss the causes & of grade of injury	Cogniti ve	Level 2 Understand and interpret	Must know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	Medicine
Hom UG-PB 4.6		Knows How	regenerati on of neurone	Identify the stages of degeneration	Cogniti ve	Level 2 Understand and interpret	Desirable To Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Pathology	

Hom UG- PB 4.7			Knows How		Discuss the stages of regeneration	Cogniti ve	Level 2 Understan d and interpret	Desirable To Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 4.8	Integrati on Of Informat ion (K- 1)		Knows How	To describe Neuromus cular Junction	Illustrate the Structure of Neuro- Muscular Junction	Cogniti ve	Level 2 Understan d and interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG- PB 4.9			Knows How		Discuss the Neuromuscul ar Transmission	Cogniti ve	Level 2 Understan d and interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 4.10			Knows How		Discuss Disorders of neuromuscul ar Junction	Cogniti ve	Level 2 (Understan d)	Must know	Lecture, Small group discussio n, CBL ,PBL	MCQs	SAQs, Viva Voce	Medicine

Hom UG- PB 4.11	Integrati on Of Informat ion (K- 1)		Knows How	To understan d the physiologi cal properties of Skeletal Muscle	Illustrate the mechanism of skeletal muscle contraction. Describe the general mechanism of muscle contraction.	Cogniti ve	Level 2 Understan d and interpret	Desirable To Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG- PB 4.12			Knows How		Discuss Molecular mechanism	Cogniti ve	Level 2 Understan d and interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 4.13			Knows How		Discuss Energetic of muscle contraction	Cogniti ve	Level 2 Understan d and interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	

Hom UG- PB 4.14			Knows How		Discuss Excitation of skeletal muscle	Cogniti ve	Level 2 Understan d and interpret	Desirable To Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 4.15	Integrati on Of Informat ion (K- 1)		Knows How	To understan d the physiologi cal properties of Smooth Muscle	Explain Contraction of smooth muscle	Cogniti ve	Level 2 Understan d and interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	
Hom UG- PB 4.16			Knows How		Explain Nervous & hormonal control of smooth muscle contraction	Cogniti ve	Level 2 Understan d and interpret	Desirable To Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 4.17	Integrati on Of Informat ion (K- 1)		Knows How	To understan d the physiologi cal properties	Illustrate Functional Anatomy of cardiac Muscle	Cogniti ve	Level 2 Understan d and interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Anatomy

Hom UG- PB 4.18			Knows How	of Cardiac Muscle	Explain process of excitability & contractility	Cogniti ve	Level 2 Understan d and interpret	Must know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	Anatomy
Hom UG- PB 4.19			Knows How		Explain properties of cardiac muscle	Cogniti ve	Level 2 Understan d and interpret	Must know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	Medicine
Hom UG- PB 4.20			Knows How		Discuss the disorders of Skeletal Muscles	Cogniti ve	Level 2 Understan d and interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 4.21	Informat ion Gatherin g Integrati on Of informat	Clinical & Applied Physiolo gy Of Muscle	Shows How	Demonstr ate 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	Demonst ration	Obser vation	OSCE	Medicine

	ion, Problem Integrati on (K-2)			changes in cardioresp iratory parameters								
Hom UG- PB 4.22			Shows How	Perform Ergograph y	Demonstrate the sequence of performing ergography.	Psycho Motor	Level 1 Observe / Imitate	Nice to know	Demonst ration	Obser vation	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
Hom UG-PB 5.1	Integration Of	Blood Fluid and It's	Knows How	Describe the composition	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			
Hom UG-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	
Hom UG-PB 5.3			Knows		Define serum	Cognitive	Level 1 recall	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-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

Hom UG- PB 5.5	Integrati on Of Informat ion (K- 1)		Knows How	Describe the origin, Forms, Variations and functions of plasma Protein	Discuss the origin of plasma protein	Cogniti ve	Level 2 Understan d and interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Biochemistr y
Hom UG- PB 5.6			Knows How		Explain the forms and functions of plasma proteins	Cogniti ve	Level 2 Understan d and interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Pathology
Hom UG- PB 5.7			Knows How		Identify the relation of diet to plasma protein	Cogniti ve	Level 2 Understan d and interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.8	Integrati on Of Informat ion (K- 1)		Knows How	Describe and discuss the synthesis and	Illustrate the structure of Haemoglobi n	Cogniti ve	Level 2 Understan d and interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Biochemistr y

Hom UG- PB 5.9			Knows How	functions of Haemoglo bin	Discuss the synthesis of Haemoglobi n	Cogniti ve	Level 2 Understan d and interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Biochemistr y
Hom UG- PB 5.10			Knows		Define Normal function of Haemoglobi n	Cogniti ve	Level 1 recall	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Biochemistr y Materia Medica
Hom UG- PB 5.11			Knows		State normal Value of different varieties of Haemoglobi n	Cogniti ve	Level 1 recall	Must know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	Medicine
Hom UG- PB 5.12			Knows How		Explain Iron metabolism	Cogniti ve	Level 2 Understan d and interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Biochemistr y

Hom UG- PB 5.13	Integrati on Of Informat ion (K- 1)		Knows How	Describe RBC formation (erythrop oiesis & its regulation) and its functions	Discuss the normal structure of RBC with its morphology	Cogniti ve	Level 2 Understan d and interpret	Desire to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy Pathology Medicine
Hom UG- PB 5.14			Knows How		discuss stages and regulation of erythropoiesi s	Cogniti ve	Level 2 Understan d and interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	
Hom UG- PB 5.15			Knows How		Discuss the fate of RBC	Cogniti ve	Level 2 Understan d and interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.16			Knows How		Discuss the haemolysis	Cogniti ve	Level 2 Understan d and interpret	Desirable to Know	Lecture, Small group discussio n, CBL	SAQs	SAQs, Viva Voce	Medicine FMT

Hom UG- 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
Hom UG- 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
Hom UG- 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
Hom UG- 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

Hom UG- PB 5.21			Knows How		Explain Physiological Jaundice	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n, CBL	SAQs	SAQs, Viva Voce	Materia Medica Repertory
Hom UG- PB 5.22			Knows How		Explain Jaundice in new-born	Cogniti ve	Level 2 Understan d / interpret	Nice to Know	Lecture, Small group discussio n, CBL	SAQs	SAQs, Viva Voce	Medicine Materia Medica Repertory
Hom UG- PB 5.23	Integrati on Of Informat ion (K- 1)		Knows How	Describe WBC formation (granulop oiesis) and its regulation	Explain different condition of leucocyte count in our body	Cogniti ve	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	Medicine Pathology
Hom UG- PB 5.24			Knows How		Classify different type of WBCs	Cogniti ve	Level 2 Understan d / interpret	Must Know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Pathology

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

Hom UG- PB 5.29	Integrati on Of Informat ion (K- 1)		Knows How	Describe the formation of platelets, functions and variations.	Discuss the structure & function of Platelets	Cogniti ve	Level 2 Understan d / interpret	Must Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine Pathology
Hom UG- PB 5.30			Knows How		Describe the Thrombopoi esis	Cogniti ve	Level 2 Understan d / interpret	Must Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.31			Knows How		Discuss its count & variation of platelets	Cogniti ve	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	Medicine
Hom UG- PB 5.32	Integrati on Of Informat ion (K- 1)		Knows How	Describe the physiologi cal basis of	Describe the process of coagulation	Cogniti ve	Level 2 (Understan d / interpret)	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Pathology Materia Medica

Hom UG- PB 5.33			Knows How	haemosta sis	Discuss the mechanism of haemostasis	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.34			Knows How		Explain stages of clotting mechanism	Cogniti ve	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Pathology Medicine
Hom UG- PB 5.35	Integrati on Of Informat ion (K- 1)		Knows How	Describe the clinical importanc e of blood coagulatio n	Discuss haemorrhagi c disorder	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n, CBL	MCQs	SAQs, Viva Voce	Medicine
Hom UG- PB 5.36	Integrati on Of Informat ion (K- 1)		Knows	Describe different blood groups	Classify the ABO blood group system	Cogniti ve	Level 1 Recall	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Pathology

Hom UG- PB 5.37			Knows How		Discuss Landsteiner's Law	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.38	Integrati on Of Informat ion (K- 1)		Knows How	Discuss the clinical importanc e of blood grouping	Describe Rhesus Blood Group	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.39			Knows How		Discuss Rh Incompatibili ty	Cogniti ve	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine, Pathology Obstetrics & Gynaecolog y
Hom UG- PB 5.40	Integrati on Of Informat ion (K- 1)		Knows How	Describe blood transfusio n	Discuss the importance of Blood transfusion	Cogniti ve	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Surgery Medicine

Hom UG- PB 5.41			Knows		List causes for Blood transfusion reaction	Cogniti ve	Level 1 Recall	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.42	Integrati on Of Informat ion (K- 1)	Immune Mechani sm	Knows How	Explain the role of lymphoid tissues in immune responses	Discuss Tissue Macrophage system	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Pathology Medicine
Hom UG- PB 5.43			Knows How		Describe the morphology and functions of Lymphocytes & Plasma cell	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Pathology
Hom UG- PB 5.44			Knows How		Explain the functions of spleen	Cogniti ve	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	

Hom UG- PB 5.45			Knows How		Discuss the formation and functions of Lymph	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.46	Integrati on Of Informat ion (K- 1)		Knows	Define and classify different types of immunity.	Define Immunity	Cogniti ve	Level 1 (Remembe r/ recall)	Must know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	
Hom UG- PB 5.47			Knows How		Explain different type of immunity	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	MCQs	LAQs, Viva Voce	
Hom UG- PB 5.48	Integrati on Of Informat ion (K- 1)		Knows How	Describe the developm ent of immunity	Discuss development of immune response	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	

Hom UG- PB 5.49			Knows How	and its regulation	Discuss Autoimmunit y & Hypersensiti vity	Cogniti ve	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.50			Knows How		Discuss Immunodefic iency Diseases	Cogniti ve	Level 2 Understan d / interpret	Desirable to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 5.51	Informat ion Gatherin g ,Integrati on Of informat ion, Problem Integrati on (K-2)	Haemat ology 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	Obser vation	Check list	Pathology Medicine
Hom UG- PB 5.52			Knows How		Interpret results of Hb estimation	Cogniti ve	Level 2 Understan d / interpret	Desirabet o know	DOAP	Obser vation	Check list	Pathology Medicine

Hom UG- PB 5.53			Shows How		Perform RBC Total Count Estimation	Psycho Motor	Level 2 (Control)	Must know	DOAP	Obser vation	Check list	Pathology
Hom UG- PB 5.54			Knows How		Interpret the results of RBC Total Count Estimation	Cogniti ve	Level 2 Understan d / interpret	Must know	DOAP	Obser vation	Check list	Pathology
Hom UG- PB 5.55			Shows How		Perform WBC Total Count Estimation	Psycho Motor	Level 2 (Control)	Must know	DOAP	Obser vation	Check list	Pathology Medicine
Hom UG- PB 5.56			Knows How		Interpret the results of WBC Total Count Estimation	Cogniti ve	Level 2 Understan d / interpret	Must know	DOAP	Obser vation	Check list	Pathology Medicine
Hom UG- PB 5.57			Shows How		Perform WBDC estimation	Psycho Motor	Level 2 (Control)	Must know	DOAP	Obser vation	Check list	Pathology

Hom UG- PB 5.58			Knows How		Interpret the results of WBC DC estimation	Cogniti ve	Level 2 Understan d / interpret	Must know	DOAP	Obser vation	Check list	Pathology
Hom UG- PB 5.59			Shows How		Record RB Cindices	Psycho Motor	Level 2 (Control)	Must know	DOAP	Obser vation	Check list	Pathology Medicine
Hom UG- PB 5.60			Knows How		Evaluate RBCindices	Cogniti ve	Level 2 Understan d / interpret	Must know	DOAP	Obser vation	Check list	Pathology Medicine
Hom UG- PB 5.61			Shows How		Perform Blood Group identification	Psycho Motor	Level 2 (Control)	Must know	DOAP	Obser vation	Check list	Pathology
Hom UG- PB 5.62			Shows How		Perform BT /CT	Psycho Motor	Level 2 (Control)	Must know	DOAP	Obser vation	Check list	Pathology
Hom UG- PB 5.63			Knows How		Interpret the results of BT /CT	Cogniti ve	Level 2	Must know	DOAP	Obser vation	Check list	Pathology

							Understand / interpret					
Hom UG-PB 5.64			Shows How		Record ESR	Psycho Motor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Pathology
Hom UG-PB 5.65			Knows How		Interpret the results of ESR estimation	Cognitive	Level 2 Understand / interpret	Must know	DOAP	Observation	Check list	Pathology
Hom UG-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
Hom UG-PB 5.67			Knows How		Interpret the results of Reticulocyte count	Cognitive	Level 2 Understand / interpret	Must know	DOAP	Observation	Check list	Pathology Medicine
Hom UG-PB 5.68			Shows How		Record Platelet Count	Psycho Motor	Level 1 (Observe / Imitate)	Nice to know	Demonstration	Observation	Observation	Pathology

Hom UG- 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
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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 2 Understand / 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 Pacemaker issue and conducting system.	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	Describe the properties of cardiac muscle including its morphology, electrical, mechanical and metabolic functions	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			
HomU G-PB 6.8	Integration Of Information (K-1)		Knows	Discuss the events occurring during the cardiac cycle	Define Cardiac cycle	Cognitive	Level 1 (Remember / recall)	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
HomU G-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	
HomU G-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	
HomU G-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

Hom UG-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's waves and intervals	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine

HomU G-PB 6.16			Know s How		Explain in electrocardio graphy with unipolar & bipolar recording.	Cognitiv e	Level 2 Understand / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 6.17	Informatio n Gathering ,Integration Of informatio nProblem Integration		Know s How	Discussarrh ythmia, heartblocka ndmyocardi al Infarction	Classify arrythmias	Cognitiv e	Level 2 Understand / interpret	Must know	Lecture, PBL, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
HomU G-PB 6.18	(K-2)		Know s How		Explain Different degree of heart block. Explain Myocardial Infarction	Cognitiv e	Level 2 Understand / interpret	Desirable to Know	Lecture, PBL , Small group discussio n	SAQs	SAQs, Viva Voce	Medicine Pathology Materia Medica Repertory
HomU G- PB 6.19	Integration Of Informatio n (K-1)		Know s	Describeha emodynami csofcirculat orysystem	List the functions of circulation	Cognitiv e	Level 1 Recall	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy

HomU G-PB 6.20			Know s		State the functions of heart	Cognitiv e	Level 1 Recall	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
HomU G-PB 6.21			Know s How		Discuss the pressure changes in vascular system	Cognitiv e	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	
HomU G-PB 6.22			Know s		Recall the structure of the blood vessels	Cognitiv e	Level 1 Recall	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Human Anatomy
HomU G-PB 6.23	Integration Of Informatio n (K-1)		Know s How	Describe the factors affect ing heart rate , and how it affects	Identify the factors affecting heart rate and how it affects	Cognitiv e	Level 2 Understand / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
HomU G-PB 6.24			Know s How		Discuss the mechanism	Cognitiv e	Level 2 Understand / interpret	Nice to know	Lecture, Small group	SAQs	SAQs, Viva Voce	

					of control of heart rate				discussion			
HomU G-PB 6.25	Integration Of Information (K-1)		Knows	Describe the regulation of cardiac output	Define cardiac output	Cognitive	Level 1 (Remember / recall)	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Materia Medica Repertory
HomU G-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
HomU G-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	
HomU G-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	

HomU G-PB 6.29	Integration Of Informatio n (K-1)		Know s How	Understand the bloodpressu re regulation	Discuss the importance of blood pressure	Cognitiv e	Level 2 Understand / interpret	Must know	Lecture, PBL, Smallgro up discussio n	SAQs	LAQs, Viva Voce	Medicine
HomU G-PB 6.30			Know s		State the factors affecting arterial blood pressure	Cognitiv e	Level 1 Recall	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Medicine
HomU G-PB 6.31			Know s How		Discuss the determinants of arterial blood pressure	Cognitiv e	Level 2 Understand / interpret	Desirable To Know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Medicine
HomU G-PB 6.32			Know s How		Describe regulation of arterial blood pressure	Cognitiv e	Level 2 Understand / interpret	Must know	PBL, Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Medicine

HomU G-PB 6.33	Integration Of Informatio n (K-1)		Know s How	Describe coronary, cerebral, capillary, pulmonary & splanchni ccirculation	Discuss the capillary circulation	Cognitiv e	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
HomU G-PB 6.34			Know s How		Discuss the Coronary circulation	Cognitiv e	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine Pathology
HomU G-PB 6.35			Know s How		Discuss the Cerebral circulation	Cognitiv e	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine Pathology
HomU G-PB 6.36			Know s How		Discuss the Splenic circulation	Cognitiv e	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
HomU G-PB 6.37			Know s How		Discuss Pulmonary circulation	Cognitiv e	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group	SAQs	SAQs, Viva Voce	Medicine

									discussion			
HomU G-PB 6.38	Information Gathering ,Integration Of information,Problem Integration (K-2)		Knows How	Describe the 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	Record blood pressure at rest and in different grade of exercise and postures	Measure the blood pressure in resting & different grade of exercise	Psychomotor	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 measurement				group discussion			
Hom UG-PB 6.42	Information Gathering, Integration Of information, Problem Integration (K-2)		Shows How	Record pulse at rest and in different grades of exercise and postures	Measure pulse at rest and in different grades of exercise	Psychomotor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Medicine
Hom UG-PB 6.43			Knows How		Discuss the variation between different arterial pulse value after measurement	Cognitive	Level 2 (Understand)	Must know	CBL, Lecture, Small group discussion	Observation	Check list	Medicine
Hom UG-PB 6.44	Information Gathering, Integration of		Shows How	Record ECG	Record ECG in a volunteer.	Psychomotor	Level 2 (Control)	Desirable to know	Demonstration	Observation	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			
HomU G-PB 6.45	Information Gathering, Integration Of information, Problem Integration (K-2)		Shows How	Demonstrate the correct clinical examination of the cardiovascular system	Locate the Apex beat	Psychomotor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Human Anatomy
HomU G-PB 6.46			Shows How		Auscultate for heart sound	Psychomotor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Medicine
HomU G-PB 6.47			Shows How		Identify different heart sounds	Psychomotor	Level 2 (Control)	Must know	Demonstration	Observation	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 of Respiratory & 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
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								nice to know			smen t	
Hom UG-PB 7.1	Integrati on Of Informat ion (K-1)	Respiratory & Environme ntal Physiology	Know s How	Describethe functional anatomyofrespiratorytract	Identify the different parts of upper respiratory tract	Cogniti ve	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 7.2			Know s How		Describe the importance of different parts of lower respiratory tract	Cogniti ve	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 7.3			Know s How		Identify the different parts oftracheo – bronchial tree, Respiratory membrane & pleura	Cogniti ve	Level 2 Understan d interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy

Hom UG- PB 7.4			Know s How		Explain the properties of Gases	Cogniti ve	Level 2 Understan d interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG- PB 7.5			Know s How		Discuss non- respiratory function of respiratory system	Cogniti ve	Level 2 Understan d interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 7.6	Integrati on Of Informat ion (K- 1)		Know s How	Describe the mechanics of normal res piration	Discuss the mechanism of Inspiration	Cogniti ve	Level 2 Understan d interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
Hom UG- PB 7.7			Know s How		Discuss the mechanism of Expiration	Cogniti ve	Level 2 Understan d interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
Hom UG- PB 7.8	Integrati on Of Informat ion (K- 1)		Know s How	Describe pressure changes during ventilation	Discuss intra- pulmonary pressure	Cogniti ve	Level 2 Understan d interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 7.9			Know s How		Discuss intra pleural pressure	Cogniti ve	Level 2 Understan d interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine

Hom UG- PB 7.10	Integrati on Of Informat ion (K- 1)		Know s How	Describe lungvolume andcapaciti es,	Discuss static lung volume & capacities	Cogniti ve	Level 2 Understan d interpret	Desirable to Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
Hom UG- PB 7.11			Know s How		Discuss dynamic lung volume and capacities	Cogniti ve	Level 2 Understan d interpret	Desirable to Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine
Hom UG- PB 7.12	Know s How		Describe alveolar surface tension	Define surface tension	Cogniti ve	Level 1 (Remember / recall)	Desirable To Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine	
Hom UG- PB 7.13	Know s How			Discuss the significance of lung surfactant	Cogniti ve	Level 2 Understan d interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce		
Hom UG- PB 7.14	Integrati on Of Informat ion (K- 1)		Know s How	Describethet ransport ofrespirator ygases	Describethet ransport Oxygen transportatio n	Cogniti ve	Level 2 Understan d interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
Hom UG- PB 7.15			Know s How		Explainthe carbon dioxide transportatio n	Cogniti ve	Level 2 Understan d interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

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

Hom UG- PB 7.21	on Of informat ion, Problem Integrati on (K-2)		Know s	hypoxia	Classify hypoxia. Define Cyanosis	Cogniti ve	Level 1Recal 1	Must know	PBL, Lecture, Small group discussion	MCQS ,SAQs	SAQs, Viva Voce	Pathology Medicine
Hom UG- PB 7.22	Informa tion Gatherin g ,Integrati on Of informat ion, Problem Integrati on (K-2)		Know s How	Describe the principles and methods of artificialres piration,	Discuss the principles of artificial respiration	Cogniti ve	Level 2 Understan d interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 7.23	Informa tion Gatherin g ,Integrati on Of informat ion, Problem Integrati on (K-2)		Know s How	Describe the principles and methods of artificialres piration,	Discuss the Methods of artificial respiration	Cogniti ve	Level 2 Understan d interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 7.24	Integrati on Of Informat ion (K- 1)		Know s How	Describe the physiology of high altitude and deep sea diving	Discuss the pressure changes during high altitude	Cogniti ve	Level 2 Understan d / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 7.25			Know s How		Discuss the effect during Rapid & slow ascent on high altitude	Cogniti ve	Level 2 Understan d / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

Hom UG- PB 7.26			Know s How		Discuss the pressure changes during Deep sea diving	Cogniti ve	Level 2 Understa nd / interpret	Nice know to	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG- PB 7.27	Informat ion Gatherin g ,Integrati on Of informat ion, Problem Integrati on (K-2)		Show s How	Perform the clinical exami nation of the respiratory sy stem in a nor mal volunteer r	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	Demonstr ation	Observ ation	Check list	Medicine
Hom UG- PB 7.28			Show s How		Perform percussion on the chest	Psycho -motor	Level 2 (Control)	Must know	Demonstr ation	Observ ation	Check list	Medicine

Hom UG- PB 7.29			Show s How		Perform the auscultation on different parts of lungs.	Psycho -motor	Level 2 (Control)	Must know	Demonstr ation	Observ ation	Check list	Medicine
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Topic No	8
Theory	Central Nervous System
Practical	
Clinical Physiology	Nervous System- Clinical Examination

Learning Objectives:-

At the end of chapter of Central 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
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Hom UG-PB 8.1	Integrati on Of Informat ion (K-1)	Nervou s System	Know s	Describetheorganiz ationofner voussystem	Identify the parts of central nervous system – brain & spinal cord with its function	Cogniti ve	Level 1Recal 1	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 8.2			Know s How		Discuss the developmental aspect of central nervous system	Cogniti ve	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 8.3			Know s		Classify nervous system	Cogniti ve	Level 1Recal 1	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 8.4			Know s How	Describethefunctio nsandpro pertiesofsynapse.	Illustrate the physiological anatomy of synapse	Cogniti ve	Level 2 Understand / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 8.5			Know s How		Discuss the electrical events	Cogniti ve	Level 2 Understand / interpret	Must know	Lecture, Small group	SAQs	SAQs, Viva Voce	

					occurring at synapses				discussion			
Hom UG-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	
Hom UG-PB 8.7	Integration Of Information (K-1)		Knows	Describe the functions and properties of receptors	Define receptor	Cognitive	Level (Remember/recall)	Nice to know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
Hom UG-PB 8.8			Knows		Classify the sensory receptors.	Cognitive	Level 1 Recall	Desirable to Know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Anatomy
Hom UG-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	

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

	Information (K-1)			transmission in the nervous system.					discussion			
Hom UG-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	
Hom UG-PB 8.16	Integration Of Information (K-1)		Knows	Describes somatic sensations & sensory tracts	Define sensory system	Cognitive	Level (Remember / recall)	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-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
Hom UG-PB 8.18			Knows How		Describe the sensory tracts of spinal cord	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine

Hom UG- PB 8.19			Know s How		Explain the somato-sensory cortex	Cogniti ve	Level Understand / interpret	2 Desirable to Know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Anatomy Medicine
Hom UG- PB 8.20			Know s How		Explain the somatic sensation – touch, pressure, pain, temperature, proprioception	Cogniti ve	Level Understand / interpret	2 Must know	Lecture, Small group discussio n Demonst ration	SAQs	SAQs, Viva Voce	Anatomy Medicine Materia Medica Repertory
Hom UG- PB 8.21	Informat ion Gatherin g ,Integrati on Of		Know s How	Describe motor tracts & mechanis m of maintena nce of muscle tone	Discuss motor areas	Cogniti ve	Level Understand / interpret	2 Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Anatomy
Hom UG- PB 8.22	informat ion, Problem		Know s How		Discuss different motor tracts of spinal cord	Cogniti ve	Level Understand / interpret	2 Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Anatomy Medicine

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

					vestibular dysfunctions				discussio n			
Hom UG- PB 8.28	Integrati on Of Informat ion (K- 1)		Know s How	Describe structure and functions of autonomic nervous system (ANS)	Differentiate between somatic and autonomic nervous system	Cogniti ve	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG- PB 8.29			Know s How		Describe the divisions of Autonomic nervous system	Cogniti ve	Level 2 Understand / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG- PB 8.30			Know s How		Discuss the responses of effector organ to autonomic nerve impulse	Cogniti ve	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 8.31	Informat ion Gatherin g, Integrati		Know s	Explain the functions, lesion & sensory disturbance	List the functions of Spinal cord	Cogniti ve	Level 1 Recall	Nice to know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Anatomy Medicine

Hom UG-PB 8.32	on Of informat ion, Problem Integrati on (K-2)		Know s How	e of Spinal cord	Illustrate the transection of spinal cord	Cogniti ve	Level 2 Understand / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine, Surgery
Hom UG-PB 8.33			Know s How		Describe the sensory disturbances of spinal cord	Cogniti ve	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
Hom UG-PB 8.34	Informat ion Gatherin g ,Integrati on Of informat ion, Problem Integrati on (K-2)		Know s How	Describe functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	Discuss the connections & functions of cerebral cortex	Cogniti ve	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Anatomy Medicine – Psychiatry Repertory
Hom UG-PB 8.35			Know s How		Discuss the connections & functions of Basal Ganglia	Cogniti ve	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy Medicine – Psychiatry Repertory
Hom UG-PB 8.36			Know s How		Explain the connections & functions of Thalamus	Cogniti ve	Level 2 Understa nd / interpret	Desirable to Know	Lecture, Small group	SAQs	SAQs, Viva Voce	Anatomy Medicine – Psychiatry

									discussion			Repertory
Hom UG- PB 8.37			Know s 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
Hom UG- PB 8.38			Know s 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
Hom UG- PB 8.39			Know s 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

Hom UG- PB 8.40			Know s How		Explain the cerebellar lesions	Cogniti ve	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Pathology Medicine – Psychiatry Materia Medica Repertory
Hom UG- PB 8.41	Integrati on Of Informat ion (K- 1)		Know s How	Describe be havioural and EEG characteristic during sleep and mechanism of responsi ble for its pr oduction	Discuss the importance of EEG	Cogniti ve	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 8.42			Know s How		Explain the Physiological Basis of EEG	Cogniti ve	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
Hom UG- PB 8.43			Know s How		Discuss the factors affecting sleep	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine

Hom UG- PB 8.44			Know s How		Describe the Physiological changes during sleep	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 8.45			Know s		Classify the types of sleep	Cogniti ve	Level 1 Recal l	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 8.46			Know s How		Discuss the factors controlling sleep cycle	Cogniti ve	Level 2 Understan d / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy Medicine
Hom UG- PB 8.47	Informa tion Gatherin g ,Integrati on Of		Know s How	Describethephysiol ogicalbasisofmemor y,learning andspeech	Discuss the mechanism and development of speech	Cogniti ve	Level 2 Understan d / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy Medicine
Hom UG- PB 8.48	informat ion, Problem		Know s How		Describe the physiological basis of learning	Cogniti ve	Level 2 Understan d / interpret	Must know	Lecture, Small group	SAQs	SAQs, Viva Voce	Anatomy Medicine Materia Medica

	Integrati on (K-2)								discussio n			Repertory
Hom UG- PB 8.49			Know s How		Discuss the physiological basis of memory.	Cogniti ve	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
Hom UG- PB 8.50			Know s How		Discuss the applied physiology of memory	Cogniti ve	Level 2 Understand / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine Materia Medica Repertory
Hom UG- PB 8.51	Informat ion Gatherin g		Show s How	Perform theclinica lexamination ofthenervo us	Perform examination of cranial nerves	Psycho -motor	Level 2 (Control)	Must know	Demonst ration	Obser vation	Checklis t	Anatomy Medicine
Hom UG- PB 8.52	,Integrati on Of informat ion, Problem		Show s How	system:High herfunctio ns,sensory system,mo torsystem,	Perform examination for speech	Psycho -motor	Level 2 (Control)	Must know	Demonst ration	Obser vation	Checklis t	Anatomy Medicine
Hom UG- PB 8.53			Show s How	reflexes, cranialnerv	Conduct the assessment of muscle tone	Psycho -motor	Level 2 (Control)	Must know	Demonst ration	Obser vation	Checklis t	Anatomy Medicine

Hom UG-PB 8.54	Integration (K-2)		Shows How	esin anormal volunteer or simulate denvironment	Conduct the assessment of muscle power	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine
Hom UG-PB 8.55			Shows How		Perform the clinical examination for reflexes	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine
Hom UG-PB 8.56			Shows How		Perform Cutaneous sensory examination	Psycho-motor	Level 2 (Control)	Must know	Demonstration	Observation	Checklist	Anatomy Medicine
Hom UG-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
Hom UG-PB 9.1	Integration Of Information (K-1)	Endocrine system	Knows	Describe the mechanism of action of steroid, protein	Define hormones	Cognitive	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

Hom UG- PB 9.2			Know s How	andamineh ormones	Discuss the characteristic of hormones	Cognitiv	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Psychology
Hom UG- PB 9.3			Know s How		Classify the hormones as per their chemistry	Cognitiv	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Biochemistr y
Hom UG- PB 9.4	Integrati on Of Informat ion (K- 1)		Know s How	Describe the regulation of secretion of hormones by hypothala mus	Discuss the regulation of hormone from the hypothalamu s	Cognitiv	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Medicine
Hom UG- PB 9.5			Know s How		Discuss the homoeostati c mechanismof secretion of hormone through Hypothalam us	Cognitiv	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine

Hom UG-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
Hom UG-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
Hom UG-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	
Hom UG-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	
Hom UG-PB 9.10			Knows		List the factors affecting growth hormone	Cognitive	Level 1 Recall	Nice to know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

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

												Gynaecology
Hom UG-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
Hom UG-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
Hom UG-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	
Hom UG-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	

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

							and / interpret		group discussion				
Hom UG- PB 9.25			Know s How		Discuss the role ofCalcitonini n the maintenance of calcium homoeostasi s in body	Cognitiv	Level 2 Underst and / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Biochemistr y Medicine Materia Medica	
Hom UG- PB 9.26			Calcit onin		Discuss the effect of altered secretion of para thyroid hormone	Cognitiv	Level 2 Underst and / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine	
Hom UG- PB 9.27			Calcit onin		Describe the synthesis, secretion, Transport, Physiologic al action, regulation & effect of altered secretion of Adrenal gland	Discuss the physiological anatomy of Adrenal Cortex gland	Cognitiv	Level 2 Underst and / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
Hom UG- PB 9.28			Calcit onin			Describe the formation, secretion, and functions	Cognitiv	Level 2 Understa	Must know	Lecture, Small	SAQs	LAQs, Viva Voce	

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

Hom UG-PB 9.32			Knows How		Discuss the physiological anatomy of Adrenal Medullary gland	Cognitiv	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-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	Cognitiv	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Materia Medica
Hom UG-PB 9.34			Knows How		Discuss the action and regulation of Glucagon	Cognitiv	Level 2 Understand / interpret	Desirable to Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
Hom UG-PB 9.35			Knows How		Discuss the action and regulation of Insulin	Cognitiv	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine Materia Medica
Hom UG-PB 9.36			Knows How		Describe the effects of altered secretion of	Cognitiv	Level 2 Understand / interpret	Must know	CBL, Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Pathology Medicine

					Pancreatic Hormone							
Hom UG-PB 9.37	Integration Of Information (K-1)		Knows How	Describe the physiology of Thymus & Pineal Gland	Describe the functions of hormone of thymus gland	Cognitive	Level 2 Underst and / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-PB 9.38			Knows How		Discuss the functions of hormone of pineal gland	Cognitive	Level 2 Underst and / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-PB 9.39			Knows How	Describe the Physiology of Local hormones	State the functions of Local hormones	Cognitive	Level 2 Underst and / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-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	Psychomotor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Obs&Gynec

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SEMESTER – 3

Topic No	10
Theory	Reproductive System
Practical	
Clinical Physiology	

Learning Objectives: -

At the end of the chapter on Reproductive 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
HomU G-PB 10.1	Integration Of Information (K-1)	Reproductive System	Knows	Describe the onset, progression, and stages of puberty.	Define puberty	Cognitive	Level 1 (Remember/ recall)	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Psychology Obstetrics & Gynaecology
HomU G-PB 10.2			Knows How	List causes and expressions of early and 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
HomU G-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.							
HomU G-PB 10.4	Integrati on Of Informat ion (K-1)		Know s How	Describe the structure and functions of malereprod uctive system.	Describe the structure of male reproductive system	Cognitive	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 10.5			Know s How		Explain the function of male reproductive system.	Cognitive	Level 2 Understa nd / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Medicine
HomU G-PB 10.6	Integrati on Of Informat ion (K-1)		Know s How	Describe the physiologic al effects of male sex hormone	Explain the functions of testis as an endocrine gland.	Cognitive	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussio n	SAQs MCQs	SAQs, Viva Voce	Psychology Medicine
Hom UG-PB 10.7			Know s How		Discuss the role of testosterone	Cognitive	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Medicine Obstetrics & Gynaecology

HomU G-PB 10.8	Integrati on Of Informat ion (K-1)		Know s How	Describe the functionsof testisandco ntrolof	Discuss the process of spermatogen esis	Cognitive	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Anatomy Medicine
HomU G-PB 10.9			Know s How	spermatog enesis&fact orsmodifyin git	Discuss the factors affecting spermatogen esis	Cognitive	Level 2 Understa nd / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	
HomU G-PB 10.10	Integrati on Of Informat ion (K- 1)		Know s How	Describefem alereproduct ivesystem&f unctionsofo varyandits	Describe structure the female reproductive tract	Cognitive	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy Obstetrics & Gynaecology
HomU G-PB 10.11			Know s How	Control.	Discuss the functions of female reproductive tract	Cognitive	Level 2 Understa nd / interpret	Desirable to Know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Obstetrics & Gynaecology
HomU G-PB 10.12			Know s How		Discuss the role of ovary as an	Cognitive	Level 2 Understa nd / interpret	Must know	Lecture, Small group	SAQs MCQs	LAQs, Viva Voce	Obstetrics & Gynaecology

					endocrine gland. List the hormones secreted by ovary.				discussion			
HomU G-PB 10.13	Integration Of Information (K-1)		Knows How	Describe menstrual cycle with hormonal, uterine and ovarian changes	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
HomU G-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
HomU G-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

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HomU G-PB 10.16	Integrati on Of Informat ion (K-1)		Know s How	Describe the physiological effects of female sex hormone s	Discuss the Gonadotroph in changes during menstrual cycle	Cognitive	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Obstetrics & Gynaecology Materia Medica
HomU G-PB 10.17			Know s How		Discuss the changes during menopause	Cognitive	Level 2 Understa nd / interpret	Must know	CBL, Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	Obstetrics & Gynaecology
HomU G-PB 10.18			Know s How	Discuss the contrace ptive metho ds for male and female.	Describe the contraceptiv e methods for male	Cognitive	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussio n	MCQs	LAQs, Viva Voce	Obstetrics & Gynaecology Community Medicine
HomU G-PB 10.19			Know s How		Describe the contraceptiv e methods for female	Cognitive	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	Obstetrics & Gynaecology Community Medicine

HomU G-PB 10.20	Integrati on Of Informat ion (K-1)		Know s How	Discuss the physiology of 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
HomU G-PB 10.21			Know s How		Explain the role of placenta as 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
HomU G-PB 10.22			Know s 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
HomU G-PB 10.23			Know s 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

Hom UG- PB 10.24			Know s How		Explain the process of lactation	Cognitive	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Obstetrics & Gynaecology Community Medicine Materia Medica
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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
HomU G-PB 11.1	Integration Of Information (K-1)	Special Senses	Knows How	Describe the perception of smells sensation	Discuss the sensation of olfaction	Cognitive	Level 2 Understand interpret	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy - Surgery - ENT
HomU G-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
HomU G-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	
HomU G-PB 11.4			Knows How		Discuss the altered	Cognitive	Level 2 Understand	Must know	CBL, Lecture, Small	MCQs	SAQs, Viva Voce	Medicine

					sensation of smell		d interpret		group discussio			
HomU G-PB 11.5	Integrati on Of Informat ion (K-1)		Know s How	Describeper ceptionof taste sensation	Discuss the sensation of Taste	Cognitiv	Level 2 Understand interpret	Desirable to Know	Lecture, Small group discussio	SAQs	SAQs, Viva Voce	Anatomy Surgery – ENT Materia Medica Repertory
HomU G-PB 11.6			Know s How		Discuss the taste receptor.	Cognitiv	Level 2 Understand interpret	Must know	Lecture, Small group discussio	SAQs	LAQ, Viva Voce	Anatomy
			Show s How		Draw the taste pathway	Psychom otor	Level 2 Control	Must Know	Demonst ation	Obser vation	DOPS	Anatomy
HomU G-PB 11.7			Know s How		Discuss the physiology of Taste	Cognitiv	Level 2 Understand interpret	Must know to	Lecture, Small group discussio	SAQs	SAQs, Viva Voce	
HomU G-PB 11.8			Know s How		Discuss the altered sensation of Taste	Cognitiv	Level 2 Understand interpret	Desirable to know	CBL, Lecture, Small group discussio	MCQs	SAQs, Viva Voce	Medicine Materia Medica

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HomU G-PB 11.9	Integrati on Of Informat ion (K- 1)		Know s How	Describe the functional anatomy of ear & auditory pathways	Describe the physiological anatomy of ear	Cognitiv	Level 2 Understan d interpret	Desirable to Know	Lecture, Small group discussio	SAQs	SAQs, Viva Voce	Anatomy Surgery – ENT Materia Medica
HomU G-PB 11.10			Show s How		Map the Auditory Pathway	Psychom otor	Level 2 Control	Must Know	Demonst ation	Obser vation	Check list	Anatomy ENT
HomU G-PB 11.11			Know s How		Describe the mechanism of hearing	Cognitiv	Level 2 Understan d interpret	Nice to know	Lecture, Small group discussio	SAQs	LAQs, Viva Voce	Surgery - ENT
HomU G-PB 11.12			Know s How		Discuss the altered sensation of Hearing	Cognitiv	Level 2 Understan d interpret	Must know	CBL, Lecture, Small group discussio	MCQs	SAQs, Viva Voce	Medicine Surgery – ENT Materia Medica
HomU G-PB 11.13			Know s How	Describe the functional anatomy of eye	Explain the structure & function of eye.	Cognitiv	Level 2 Understan d interpret	Must Know	Lecture, Small group discussio	SAQs	SAQs, Viva Voce	Anatomy Surgery - Ophthalm ology

HomUG-PB 11.14	Integrati on Of Informat ion (K-1)		Know s How	Describe the physiology of image formation	Describe the visual pathway	Cognitiv	Level 2 Understan d interpret	Must know	Lecture, Small group discussio	SAQs	LAQs, Viva Voce	
HomUG-PB 11.15			Know s How		Discuss the principles of optics, visual acuity, Visual reflex	Cognitiv	Level 2 Understan d interpret	Must know	Lecture, Small group discussio	MCQs	SAQs, Viva Voce	Surgery – Ophthalm ology
HomUG-PB 11.16	Know s How		Describe the physiology of vision including colour vision	Discuss the photochemis try of vision	Cognitiv	Level 2 Understan d interpret	Nice to know	Lecture, Small group discussio	MCQs	SAQs, Viva Voce	Surgery – Ophthalm ology	
HomUG-PB 11.17	Know s How			Discuss the photopic &scotopic vision	Cognitiv	Level 2 Understan d interpret	Nice to know	Lecture, Small group discussio	SAQs	SAQs, Viva Voce	Surgery – Ophthalm ology	
HomUG-PB 11.18	Know s How			Discuss the visual adaptation, visual accommodat ion & night blindness	Cognitiv	Level 2 Understan d interpret	Desirable to know	PBL, Lecture, Small group discussio	SAQs	SAQs, Viva Voce	Surgery – Ophthalm ology Materia Medica	
Integrati on Of Informat ion (K-2)												

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HomU G-PB 11.19	Information Gathering, Integration Of information, Problem Integration (K-2)		Know s How	Describe the refractive errors and colour blindness	Discuss the different types of refractive errors	Cognitiv	Level Understan d interpret	Desirable to know	Lecture, Small group discussio	MCQs	LAQs, Viva Voce	Surgery – Ophthalm ology Materia Medica Repertory
HomU G-PB 11.20			Know s How		Discuss the colour blindness	Cognitiv	Level Understan d interpret	Desirable to know	CBL, Lecture, Small group discussio	MCQs	SAQs, Viva Voce	Surgery – Ophthalm ology Materia Medica
HomU G-PB 11.21			Know s		List the causes of Nystagmus	Cognitiv	Level 1 Recall	Nice to know	CBL, Lecture, Small group discussio	SAQs	SAQs, Viva Voce	Surgery – Ophthalm ology Materia Medica
HomU G-PB 11.22	Information Gathering, Integration Of information, Problem		Show s How	Demonstrat e Testing of v isual acuity, colour and fi eld of vision in a volunteer	Perform the testing of visual acuity, colour and field of vision	Psycho Motor	Level 2 (Control)	Desirable to know	Demonst ation	Obser vation	Check list	Surgery – Ophthalm ology
Hom UG- PB 11.23			Know s How		Interpret the testing of visual acuity,	Cognitiv	Level Understand / interpret	Nice to know	CBL, Lecture, Small	SAQs	SAQs, Viva Voce	Surgery – Ophthalm ology

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	Integrati on (K-2)				colour and field of vision				group discussio			Materia Medica
HomU G-PB 11.24	Informat ion Gatherin g		Shows How	Demonstra te testing of hearing in a volunteer	Perform the testing of hearing in a volunteer	Psycho Motor	Level 2 (Control)	Nice to know	Demonst ation	Obser vation	Check list	Surgery – ENT
Hom UG- PB 11.25	,Integrati on Of informat ion, Problem Integrati on (K-2)		Knows How		Interpret the testing of hearing in a volunteer	Cognitiv	Level 2 Understan d / interpret	Nice to know	CBL, Lecture, Small group discussio	SAQs	SAQs, Viva Voce	Surgery – Ophthalm ology Materia Medica
HomU G-PB 11.26	Informat ion Gatherin g		Shows How	Demonstra te testing for smell in a volunteer	Perform testing for smell in a volunteer	Psycho Motor	Level 2 (Control)	Nice to know	Demonst ation	Obser vation	Check list	Surgery – ENT
Hom UG- PB 11.27	,Integrati on Of informat ion, Problem Integrati on (K-2)		Knows How		Interpret testing for smell in a volunteer	Cognitiv	Level 2 Understan d / interpret	Nice to know	CBL, Lecture, Small group discussio	SAQs	SAQs, Viva Voce	Surgery – Ophthalm ology Materia Medica

Hom UG- PB 11.27	Information Gathering, Integration Of information		SHOW HOW	Demonstrate testing for taste sensation in volunteer	Perform testing for taste sensation in volunteer	Psycho Motor	Level 2 (Control)	Must know	Demonstration	Observation	Check list	Anatomy Surgery – ENT
Hom UG- PB 11.29	ion, Problem Integration (K-2)		Know s 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
Hom UG-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
Hom UG-PB 12.2			Knows		Recall the structure of digestive system	Cognitive	Level 1 Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy

Hom UG-PB 12.3			Knows		Recognise the structure of small intestine	Cognitive	Level 1 Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-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
Hom UG-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 1 Recall	Desirable to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Materia Medica
Hom UG-PB 12.6			Knows How		Discuss composition of saliva	Cognitive	Level 2 Understand / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Biochemistry
Hom UG-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

Hom UG-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	
Hom UG-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	
Hom UG-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
Hom UG-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	
Hom UG-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

Hom UG-PB 12.13			Know s How		Discuss the role of upper & lower oesophageal sphincter	Cogniti ve	Level 2 Understa nd / interpret	Nice know to	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
Hom UG-PB 12.14			Know s		List the common oesophageal motility disorders	Cogniti ve	Level 1 Recall	Nice Know to	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Surgery
Hom UG-PB 12.15	Integrati on Of Informat ion (K-1)		Know s	Describe the compositio n, mechanism of secretion, function & regulation of Gastric Juice	Recall the macro and micro structure of stomach	Cogniti ve	Level 1 Recal l	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 12.16			Know s How		Discuss the functions of stomach	Cogniti ve	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
Hom UG-PB 12.17			Know s How		Discuss the composition & functions of gastric juice	Cogniti ve	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Biochemistr y

Hom UG-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
Hom UG-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	
Hom UG-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
Hom UG-PB 12.21			Knows		Mention the three phases of vomiting	Cognitive	Level 1 Recall	Nice to know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Materia Medica Repertory
Hom UG-PB 12.22	Integration Of Information (K-1)		Knows	Describe the composition, mechanism	Recall the macro and micro structure of Pancreas	Cognitive	Level 1 Recall	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy

Hom UG-PB 12.23			Know s How	of secretion, function & regulation of Pancreatic Juice	Discuss the composition & functions of pancreatic juice	Cogniti ve	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Biochemistr y
Hom UG-PB 12.24			Know s How		Discuss the mechanism & regulation of pancreatic juice secretion	Cogniti ve	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
Hom UG-PB 12.25			Know s How		Describe exocrine pancreatic insufficiency	Cogniti ve	Level 2 Understa nd / interpret	Desirable to Know	CBL, Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine Materia Medica Repertory
Hom UG-PB 12.26	Integrati on Of Informat ion (K-1)		Know s How	Describe the structure & function of liver & Gall bladder	Discuss the structure & functions of Liver	Cogniti ve	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 12.27			Know s How		Explain the signs of liver insufficiency	Cogniti ve	Level 2 Understa nd / interpret	Desirable to Know	CBL, Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Medicine

Hom UG-PB 12.28			Knows How		Describe the structure & functions of gall bladder	Cognitive	Level 2 Understanding / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Repertory
Hom UG-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 Understanding / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Biochemistry
Hom UG-PB 12.30			Knows How		Discuss the composition & function of gall bladder bile	Cognitive	Level 2 Understanding / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Biochemistry
Hom UG-PB 12.31			Knows How		Describe the control & mechanism of bile secretion	Cognitive	Level 2 Understanding / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
Hom UG-PB 12.32			Knows How		Describe the clinical significance of liver functions.	Cognitive	Level 2 Understanding / interpret	Desirable to know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Materia Medica

HomU G-PB 12.33			Know s How		Describe the clinical significance of Gall Bladder functions	Cognitiv e	Level 2 Understa nd / interpret	Desirable know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Surgery
HomU G-PB 12.34	Integrati on Of Informat ion (K-1)		Know s	Describe the compositio n, mechanism of secretion, function & regulation of Small intestine	Recognise the macro and micro structure of Small intestine	Cognitiv e	Level 1 Recall	Desirable to know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Repertory
Hom UG- PB 12.35			Know s How		Discuss the composition & functions of Succus Entericus	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Biochemistr y
HomU G-PB 12.36			Know s How		Discuss the mechanism & regulation of secretions of Succus Entericus	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

HomU G-PB 12.37			Know s How		Describe the process of digestion in small intestine	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomU G-PB 12.37			Know s How		Describe the Malabsorptio n Syndrome	Cognitiv e	Level 2 Understa nd / interpret	Nice to Know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine Materia Medica
HomU G-PB 12.39	Integrati on Of Informat ion (K-1)		Know s How	Describe the movement of gastrointes tinal tract, it's regulation & function.	Explainerist alsis as intestinal movement	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Materia Medica
Hom UG- PB 12.40			Know s How		Describe segmentatio n as intestinal movement	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomU G-PB 12.41			Know s How		Discuss the clinical importance of small intestine	Cognitiv e	Level 2 Understa nd / interpret	Desirable to Know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine

HomU G-PB 12.42	Integrati on Of Informat ion (K-1)		Know s How	Describe the movement of large intestine & defecation as a process.	Discuss the movements of large intestine	Cognitiv e	Level 2 Understa nd / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG- PB 12.43			Know s How		Describe the process of absorption &secretion in large intestine	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Materia Medica
HomU G-PB 12.44			Know s How		Discuss the process of defecation	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Repertory
HomU G-PB 12.45			Know s How		Discuss the clinical significance of large intestine	Cognitiv e	Level 2 Understa nd / interpret	Desirable to know	CBL, Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Medicine
HomU G-PB 12.46	Integrati on Of Informat ion (K-1)		Know s How	Describe the physiology of digestion and	Discuss the digestion & absorption of carbohydrate s	Cognitiv e	Level 2 Understa nd / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	

HomU G-PB 12.47			Know s How	absorption of nutrients	Discuss the digestion & absorption of Fats	Cognitiv e	Level 2 Understa nd / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomU G-PB 12.48			Know s How		Discuss the digestion & absorption of Proteins	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	MCQs SAQs	LAQs, Viva Voce	
HomU G-PB 12.49			Know s How		Discuss absorption of water, electrolytes	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomU G-PB 12.50			Know s How		Describe the absorption of vitamins & minerals	Cognitiv e	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	
HomU G-PB 12.51	Informat ion Gatherin g ,Integrati on Of informat ion, Problem		Show s How	Observe the process of conducting liver function test	Observe the liver function test	Psycho Motor	Level 1 (Observe / Imitate)	Nice to know	Demonstrat ion	Obser vation	Checkli st	Medicine

	Integrati on (K-2)											
Hom UG- PB 12.52	Informat ion Gatherin g ,Integrati on Of informat ion, Problem Integrati on (K-2)		Shows How	Demonstrat e the Gastrointes tinal system examinatio n	Perform the inspection of gastrointesti nal system in the clinica lexamination	Psycho Motor	Level 2(Contro l)	Desirable to know	Demonstrat ion	Obser vation	Checkl ist	Anatomy Medicine
Hom UG- PB 12.53			Know s How		Interpret the findings of inspection of gastrointesti nal system in clinical examination	Cognitiv e	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy Medicine
Hom UG- PB 12.54			Shows How		Perform the palpation of gastrointesti nal system in the clinica lexamination	Psycho Motor	Level 2 (Control)	Desirable to know	Demonstrat ion	Obser vation	Checkl ist	Anatomy Medicine
Hom UG- PB 12.55			Know s Ho		Interpret the findings of palpation of gastrointesti nal system in	Cognitive	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy Medicine

					clinical examination							
HomU G-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
HomU G-PB 12.57			Knows How		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
HomU G-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
HomU G-PB 12.59			Knows How		Interpret the findings of auscultation	Cognitive	Level 2 Understand	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy Medicine

					of gastrointesti nal system in clinical examination		nd interpret /					
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Topic No	13
Theory	Renal Physiology
Practical	Kidney Function Test
Clinical Physiology	

Learning Objectives: -

At the end of the chapter Renal 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
HomU G-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 1 Recall	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Anatomy Materia Medica
HomU G-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	
HomU G-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
HomU G-PB 13.4			Knows		Classify the type of nephrons	Cognitive	Level 1 Recall	Must Know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Anatomy

HomU G-PB 13.5			Know s How		Describe the structure and functions of juxtaglomerular apparatus	Cognitiv	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Anatomy
HomU G-PB 13.6	Integrati on Of Informat ion (K-1)		Know s How	Explain the role of renin – angiotensin system	Explain the secretions from juxtaglomerular apparatus & their regulation	Cognitiv	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Medicine
HomU G-PB 13.7	Integrati on Of Informat ion (K-1)		Know s How	Describe the mechanism of urine formation	Explain the process of glomerular filtration	Cognitiv	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomU G-PB 13.8			Know s How		Describe the regulation of Glomerular Filtration Rate	Cognitiv	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
HomU G-PB 13.9			Know s How		Discuss the mechanism of GFR.	Cognitiv	Level 2 Understa nd / interpret	Must know	Lecture, Small group	SAQs	LAQs, Viva Voce	

					Explain the factors affecting GFR				discussion			
HomU G-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 Understanding / interpret	Must know	Lecture, Small group discussion	MCQs	LAQs, Viva Voce	Medicine Biochemistry
HomU G-PB 13.11			Knows How		Describe the renal transport mechanisms throughout the tubular segments	Cognitive	Level 2 Understanding / interpret	Desirable to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	Biochemistry
HomU G-PB 13.12			Knows How		Describe the transport of individual substances in different segments of renal tubule	Cognitive	Level 2 Understanding / interpret	Nice to know	Lecture, Small group discussion	MCQs	SAQs, Viva Voce	

Hom UG-PB 13.13	Integrati on Of Informat ion (K-1)		Know s How	Describe the concentrati on and diluting mechanism in the kidney	Discuss the general consideratio n of urine concentratio n mechanism	Cognitiv	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Medicine
Hom UG-PB 13.14			Know s How		Describe the counter current multipliers	Cognitiv	Level 2 Understa nd / interpret	Desirable to Know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	Biochemistr y
Hom UG-PB 13.15			Know s How		Discuss the counter current exchangers	Cognitiv	Level 2 Understa nd / interpret	Desirable to Know	Lecture, Small group discussio n	MCQs	SAQs, Viva Voce	
Hom UG-PB 13.16	Informat ion Gatherin g ,Integrati on Of informat ion, Problem Integrati on (K-2)		Know s How	Describe the renal regulation of acid – base balance	Discuss the renal regulation of acid-base balance	Cognitiv	Level 2 Understa nd / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Biochemistr y
Hom UG-PB 13.17			Know s How		Describe the buffer system in the kidney	Cognitiv	Level 2 Understa nd / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Biochemistr y

Hom UG-PB 13.18	Integrati on Of Informat ion (K-1)		Know s	Describe the physiology of micturition	Define micturition	Cognitiv	Level 1 (Remember/ recall)	Desirable to Know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	
Hom UG-PB 13.19			Know s How		Discuss the nerve supply of urinary bladder	Cognitiv	Level 2 Understand / interpret	Nice to know	Lecture, Small group discussio n	SAQs	SAQs, Viva Voce	Anatomy
Hom UG-PB 13.20			Know s How		Describe the micturition reflex	Cognitiv	Level 2 Understand / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQs, Viva Voce	Anatomy
Hom UG-PB 13.21	Informat ion Gatherin g ,Integrati on Of informat ion, Problem Integrati on (K-2)		Show s How	Describe the Kidney function teste	Perform the physical, chemical, and microscopica l examination of urine	Psycho Motor	Level 2 (Control)	Must know	Demonst ration	Observ ation	OSCE	Biochemistr y
Hom UG-PB 13.22			Know s How		Recognise the normal values of physical, chemical,	Cognitiv	Level 2 Understand / interpret)	Must know	Lecture, Small group	SAQs	LAQ, Viva Voce	Biochemistr y

					and microscopica l examination of urine				discussio n			
Hom UG- PB 13.23			Show s How		Perform examination for the abnormal constituents of urine	Psycho Motor	Level 3(Control)	Must know	Demonst ration	Observ ation	Check list	Biochemistr y Medicine
Hom UG- PB 13.24			Know s How		Interpret the results of examination for the abnormal constituents of urine	Cognitiv	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQ, Viva Voce	Biochemistr y Medicine
Hom UG- PB 13.25			Know s How		Interpret the renal clearance test for glomerular function	Cognitiv	Level 2 Understan d / interpret	Must know	Lecture, Small group discussio n	SAQs	LAQ, Viva Voce	Biochemistr y Medicine
Hom UG- PB 13.26			Know s How		Interpret the renal clearance test for	Cognitiv	Level 2 Understan	Must know	Lecture, Small group	SAQs	LAQ, Viva Voce	Biochemistr y Medicine

Learning Objectives: -

- 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
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Hom UG-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	
Hom UG-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	
Hom UG-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	
Hom UG-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	
Hom UG-PB 14.5			Knows		List major functions of carbohydrates.	Cognitive	Level 1 Recall	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-PB 14.6			Knows How		Discuss the food sources of	Cognitive	Level 2 Understand	Desirable to Know	Lecture, Small	SAQs	SAQs, Viva Voce	

					carbohydrate s.		nd interpret /		group discussion			
Hom UG- PB 14.7			Knows How		Explain the processes of glycolysis	Cogniti ve	Level 2 Understa nd / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
Hom UG- PB 14.8			Knows How		Explain the process of gluconeogen esis	Cogniti ve	Level 2 Understa nd / interpret	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	
Hom UG- PB 14.9			Knows How		Describe the process of ATP production through oxidative phosphorylati on	Cogniti ve	Level 2 Understa nd / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG- PB 14.10	Integrati on Of Informat ion (K- 1)		Knows How	Describe the Protein Metabolism	Discuss the special features of protein Metabolism	Cogniti ve	Level 2 Understa nd / interpret	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	

Hom UG-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	
Hom UG-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	
Hom UG-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
Hom UG-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	
Hom UG-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	
Hom UG-PB 14.16	Integration Of		Knows How	Describe the enzymes	Discuss the concept of enzyme,	Cognitive	Level 2 Understand	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			
Hom UG-PB 14.17			Knows		Mention the major functions of enzymes.	Cognitive	Level 1 Recall	Must Know	Lecture, Small group discussion	SAQs	LAQs, Viva Voce	Physiology
Hom UG-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
Hom UG-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
Hom UG-PB 14.20			Knows		Classify vitamins	Cognitive	Level 1 Recall	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG-PB 14.21			Knows		Mention common vitamin deficiencies		Level 1 Recall	Desirable to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Physiology Medicine

												Community Medicine
Hom UG- PB 14.22	Informat ion Gatherin g , Integrati on Of informat ion, Problem Integrati on (K-2)		Knows	Demonstrat ion of Uses Of Instruments Or Equipment	List the use of different instruments in biochemistry experiments	Cognitiv e	Level 1 Recall	Must Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	
Hom UG- PB 14.23			Shows How	Demonstrat e the Qualitative Analysis of Carbohydrate s, Proteins And Lipids	Perform the qualitative analysis of carbohydrate	Psycho Motor	Level 2 (Control)	Must Know	Demonstr ation	Obser vation	Check list	Pathology
Hom UG- PB 14.24			Knows How		Interpret the results of Qualitative analysis of carbohydrate	Cognitiv e	Level 2 Understan d / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
Hom UG- PB 14.25			Shows How		Observe the qualitative analysis of Protein	Psycho Motor	Level 1 (Observe / Imitate)	Desirable to Know	Demonstr ation	Obser vation	Check list	Pathology
Hom UG- PB 14.26			Knows How		Interpret the results of Qualitative	Cognitiv e	Level 2 Understan d / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology

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

					Total proteins							
Hom UG-PB 14.32			Knows How		Interpret the results of Qualitative analysis of total protein	Cognitive	Level 2 Understood / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
Hom UG-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
Hom UG-PB 14.34			Knows How		Interpret the results of Quantitative estimation of Uric acid	Cognitive	Level 2 Understood / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology
Hom UG-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
Hom UG-PB 14.36			Knows How		Interpret the results of Lipid profile testing done	Cognitive	Level 2 Understood / interpret	Nice to Know	Lecture, Small group discussion	SAQs	SAQs, Viva Voce	Pathology

					in laboratory	a							
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8. PRACTICAL TOPICS

PRACTICAL & CLINICAL PHYSIOLOGY:-

<u>No</u>	<u>Practical</u>	<u>Demonstration</u> / <u>Performance</u>
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	<u>Interpretation and Discussion of Results of Biochemical Tests</u>	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 BOOKSTHEORY

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 A et al (2021) C C Chatterjee's Manual of Practical Physiology: CBS Publishers 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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