COURSE CURRICULUM FOR FIRST PROFESSIONAL BUMS

(PRESCRIBED BY NCISM)

MANAFEUL AZA
SUBJECT CODE: UNIUG-MZ
HUMAN PHYSIOLOGY

(Applicable from 2021-2022 batch onwards for five years or until further notification by NCISM, whichever is earlier)

ncism

प्राणाभिसरः प्राणायतनानाम्

BOARD OF UNANI, SIDDHA AND SOWA RIGPA
NATIONAL COMMISSION FOR INDIAN SYSTEM OF MEDICINE
NEW DELHI-110058

SCAN ME

UNIUG-MZ

NCISM

I professional BUMS

Subject Code: **UNIUG-MZ**

Manafeul Aza

KEY POINTS

Total number of Teaching hours: 600			
Lecture hours (LH) - Theory		**200 Hours**	**200 Hours (LH)**
Paper I	97 Hours		
Paper II	103 Hours		
Non-Lecture hours (NLH) – Theory		**120 Hours**	**400 Hours (NLH)**
Paper I	58 Hours		
Paper II	62 Hours		
Non-Lecture hours (NLH) - Practical		**280 Hours**	

Examination (Papers & Mark Distribution)					
Item	**Theory Component Marks**	**Practical Component Marks**			
		Practical	**Viva**	**Elective**	**IA**
Paper I	**100**	**100**	**20**	**10**	**20**
Paper II	**100**				
Sub-Total	**200**	**150**			
Total marks	**350**				

Preface

In Unani Medicine, seven factors called Umoore Tabiya, are considered essentials for the existence of human beings. Among these factors Afa'al (functions) of the body are placed at the seventh and last position indicating the functions of the body as the pinnacle of the biological existence of human beings. In the subject Manafeul Aza we study the functions of human body, from the point of view of both Unani and modern understanding. Knowing how the body works at the cellular level, organ level and as a whole? including the physical and chemical processes involved is the main domain of Manafeul Aza. Study of Manafeul Aza also includes the understanding of how body maintains a constant state of its internal environment (homeostasis) and how different organ systems play a role to maintain it. Knowing how an interchange between static and dynamic conditions take place and how after a brief change body gets back to a new steady state is a key area of Manafeul Aza. Another area of Manafeul Aza is the study of various control system of the body and how they regulate various functions. In this subject the students will study various topics like Homeostasis, Action Potential, Membrane transport, Muscle physiology and acid base balance. Various body systems which students will study are Haemopoietic system, Cardiovascular system, Digestive system, Respiratory system, Nervous system, Excretory system and endocrine system.

Index`

First BUMS

Course code and Names of Course

	Course code	**Name of Course**
	UNIUG-MZ	Manafeul Aza (Human Physiology)

Table 1- Course outcomes and matched Program outcomes.

SR1 CO No	**A1 Course Outcome (CO) UNIUG-MZ At the end of the course UNIUG-MZ, the student should be able to-**	**B1 Course Outcome matched with program outcomes.**
1	Define *Al-istitbab* (homeostasis) and *Tabiat* and explain how homeostatic mechanisms normally maintain a constant interior milieu at organ, tissue and cellular level including the chemical and physical processes involved	**PO1, PO2**
2	State the *Nizame Aaza* (organ system of the body), explain the mechanisms by which each *Uzu works*, and relate the functions and the *Tashreeh (anatomy)* and *Nusujiyyat (histology)* of each organ system.	**PO1, PO2**
3	Understand and demonstrate the interrelations of the *Nizam-e –Aza* to each other.	**PO1, PO2**
4	Predict and explain the integrated responses of the organ systems of the body to *Tabayi ijahad (physiological stress)* and *Ghairtabayi ijhad* (pathological stresses).	**PO2**
5	Explain the *Mahiyatul marzi* (patho-physiology) of common diseases related to the organ systems of the body.	**PO2**
6	Measure and compare normal and abnormal values for a variety of *Wasait-e-tabayi (physiological parameter)* obtained through experiments	**PO1, PO2, PO4**
7	Utilize Data from experimental studies to explain the *Tabyi Usool* of body systems	**PO1, PO2, PO8**
8	Use *Manafeul Azayi istilahat (*physiological terminology) to comprehend and communicate information on body function (lab Reports)	**PO2, PO5**
9	Conduct experiments which illustrate chemical and physical concepts including *Paimaish zaqtud dam qavi (*blood pressure measurement), *Paimaish ahjam-e-aljihaz altanafusi* (measurement of respiratory volumes), *Tajziya-e- baul (urine analysis)*, and *Tajziya-e-dam (Blood examination)*.	**PO2, PO4**

Table 2: Contents of Manafeul Aza - Paper – I (Theory)

	A2 List of Topics UNIUG-MZ	B2 Term	C2 Marks	D2 Lecture hours	E2 Non-Lecture hours
1	***Umoomi Manafeul Aza* (General physiology)**	I	10	9	05
	(a) Al-istitbab (Homeostasis)الاستتباب				
	(b) Transport across cell membrane انتقال بین الغشاءالخلیہ				
	(c) Action potential جہدالفعل				
	(d) Muscle physiology فعلیات الاعضاء				
	(e) Macromolecules جزئی کبیروی سالمات کبیرہ				
	(f) Protein synthesis پیدائش لحمین				
	(g) Acid-base balance التوازن الحمضي القلوي				
	(h) Water balance التوازن الماء				
2	**Study of *Khulia* and *Insaja* (Cytology and Histology)**	I	15	9	06
	(a) Qhulia ki khurd beeni sakht-o-Afaal, (Brief discussion and introduction of cytology) خلیہ کی خورد بینی ساخت و افعال				
	(b) Tareef –e- insaja (definition) تعریف انسجہ				
	(c) Aqsaam –e- insaja (types)اقسام انسجہ				
	(d) Insaja ki Khurd beeni sakht ka phailao-wa-afaal, (distribution and function of tissues), انسجہ کی خورد بینی ساخت کا پھیلاؤ و افعال				
	(e) Nassej-e-bushra (epithelial tissue) نسیج بشریٰ				
	(f) Naseej-e-waasil (connective tissue), نسیج واصل				
	(g) Nassj-e-azlee (muscular tissue نسیج عضلی				
	(h) Naseeje asabi (nervous tissue). نسیج عصبی				
3	***Khoon wa Nizam-e-Damwi* (Blood & Haemopoietic System)**خون و نظام دموی	II	30	30	15
	(a) Khoon ki tareef (definition of blood), Ajza (constituents), Afaal (functions), Lazoojat aur hajam (viscosity and volume). خونکی تعریف،اجزاء، افعال، لزوجت اور حجم				
	(b) Maiyat-ud-dum (blood plasma): Ajza (constituents), Mavaad-e-lahmiya, aur afaal (plasma proteins and their functions) مائیت الدم ،اجزاء، مواد لحمیہ اور انکے افعال				
	(c) Kurriyat-e-hamra (RBC): Saqht, ajza-e-tarkeebi (structure, composition), Paidaish (formation), Numu (development), aur Anjam (fate), Majmooyee taadaat (total count), Miqdaar ki				

	takhmeen ke tareeqe (methods of estimation), Aur unke feliyati iqhtilaaf (& their physiological variations) ، کریات حمراء : ساخت،اجزائے ترکیبی، پیدائش نمو اور انجام ،مجموعی تعداد،مقدار کی تخمین کے طریقے اور انکے فعلیاتی اختلاف				
	(d) Hamratuddam (haemoglobin) ke Ajza-e-tarkeebee (composition), Aqsaam (varieties), Khwaas (properties),Miqhdaar ki takhmeen ke tareeqe (method of estimation), Aur afaal (and functions ، حمرۃالدم کے اجزائے ترکیبی،اقسام، خواص مقدار کی تخمین کے طریقے اور افعال.				
	(e) Kurriyat-e-baiza (WBC) ki Saqht(structure), Aqsaam(types), Paidaish(formation), Afaal (functions), Aur inke baahami tanasub (& their differential count ، کریات بیضاء : ساخت،اجزائے ترکیبی، پیدائش ، نمو اور انجام ،مجموعی تعداد، اور انکے باھمی تناسب ، مقدار کی تخمین کے طریقے اور انکے فعلیاتی اختلاف				
	(f) Aqrase damviya (platelets) ki Saqht (structure), Paidaish (formation) & Afaal (functions). اقراص دمویہ کی ساخت، پیدائش اور افعال				
	(g) Injimaduddam (coagulation of blood) ki Tareef (definition), Awamil e injimaduddam (coagulation factors), Waqfa-e-jiryanuddam (bleeding time), Waqfa-e-injimaduddam (clotting time) aur unki takhmeen (and their estimation) انجمادالدم کی تعریف،عوامل انجمادالدم،وقفہ جریان الدم، وقفہ انجمادالدم اور انکی تخمین				
	(h) Khoon ki girohbandi (Blood Groups) خون کی گروہ بندی				
	(i) Intiqaluddam (blood Transfusion) & Blood Banks انتقال الدم				
4	***Nizam-e-Urooq-i-Lymphavia aur Shabki-o-Bashree Baatini*** **(Lymphatic & Reticulo-endothelial system** نطام عروق لمفاویہ اورشبکی و بشری باطنی	I	5	03	02
	(a) Rutubat-e-limfavia ki paidaish aur tarkeeb (formation and composition of lymph) رطوبت لمفاویہ کی پیدائش اور ترکیب				
	(b) Rutubat-e-limfavia ka dauran (lymphatic channels and lymphatic drainage) رطوبت لمفاویہ کا دوران				
	(c) Ghudood-e- limfavia (lymph glands)غدود لمفاویہ				
	(d) Nizam-e-shabkiya mubtina ki tamheed aur afaal (introduction to reticulo-endothelial system, and its functions)نطام شبکیہ مبطنہ کی تمہید اور افعال				
	(e) Tihaal aur iske afaal (spleen & its functions). طحال				

	اور اسکے افعال				
5	***Nizam-e-Dauran-e-Khoon* (Circulatory system)** نظام دوران خون	III	20	23	15
	(a) Tareef(introduction) تعریف				
	(b) Samamaat-e-qalb aur inke afaal (valves of heart and their actions) صمامات قلب اور انکے افعال				
	(c) Qalb ke makhsoos itsaali ansaja (special junctional tissues), قلب کے مخصوص اتصالی انسجہ				
	(d) Azla-e-qalb ki khusoosiyat (properties of cardiac muscles) عضلہ قلب کی خصوصیات				
	(e) Daura-e-qalbi (cardiac cycle) دورہ قلبی				
	(f) Aswaat-e-qalb (heart sounds) اصوات قلب				
	(g) Suqoot-e-qalb (heart block) سقوط قلب				
	(h) Aasaab-e-qalb (nerves of the heart), اعصاب قلب				
	(i) Mrakaz-e-qalb aur iske afaal (cardiac centre & its function) مرکز قلب اوراسکے افعال				
	(j) Barqi qalb nigari (electro-cardiograph برقی قلب نگاری				
	(k) Fisharruddum aur iske feliyati avamil (blood pressure and its physiological control) فشارالدم اوراسکے فعلیاتی عوامل				
6	***Hayateen* (Vitamins)** حیاتین	II	10	6	04
	(a) Hayateen ki tareef (definition)حیاتین کی تعریف				
	(b) Aqsaam (types) اقسام				
	(c) Miqdar khurak (daily requirement) مقدار خوراک				
	(d) Afaal (functions) افعال				
7	***Istehala* (Metabolism)** استحالہ	III	10	17	11
	(a) Istehala ki tareef (introduction to metabolism) استحالہ کی تعریف				
	(b) Nashasta ka istehala (metabolism of carbohydrate) نشاستہ کا استحالہ				
	(c) Shamiyat ka istehala (metabolism of lipids شحمیات کا استحالہ				
	(d) Humooz-e-shorain ka istehala (metabolism of amino acids)حموض شورین کا استحالہ				
	(e) Madaniyat aur paani ka istehala (mineral and water metabolism).معدنیات اور پانی کا استحالہ				
Total				**97**	**58**

Table 2: Contents of Manafeul Aza - Paper – II (Theory)

	A2 List of Topics UNIUG-MZ	B2 Term	C2 Marks	D2 Lecture hours	E2 Non-Lecture hours
1.	***Nizam-e-Hazm* (Digestive system)**نظام ھضم	I	15	17	07
	(a) Tamheed-e-nizam-e-hazm (introduction of digestive system) تمہید نظام ھضم				
	(b) Khurd beeni sakht of ghudood-e-luabiya (histological structure of salivary glands), luab-e-dahan ki tarkeeb (composition of saliva) غدود لعابیہ کی خوردبینی ساخت،لعاب دھن کی ترکیب				
	(c) Tarssho aur afaal (secretion of saliva and functions) لعاب دہن کا ترشح اور افعال				
	(d) Rutubat-e-maaddi (gastric juice) رطوبات معدی				
	(e) Rutubat-e-mayvi, aur rutubat-e-safravi ki tarkeeb,tarassho aur afaal (composition of succus entericus and bile secretion and their functions) رطوبات معوی اور رطوبات صفراوی کی ترکیب ، ترشح اور افعال				
	(f) Majra-e-ghizai ke harkat aur unke afaal (movements of alimentary canal and their functions مجریٰ غذائی کی حرکات اور انکے افعال				
	(g) Fuzla ki paidaish-o-iqhraj (formation of faeces and defecation) فضلہ کی پیداش و اخراج				
	(h) Jigar ki saaqht-o-afaal, (structure and & functions of liver) جگر کی ساخت و افعال				
	(i) hazm-e-nishashta (digestion of carbohydrate), ھضم نشاستہ				
	(j) hazm-e- shorain (digestion of protein) ھضم شورین				
	(k) andhazm-e-shaham (digestion of lipids) ھضم شحم				
	(l) paani ka injezab (absorption of water) پانی کا انجذاب				
2.	***Nizam-e-Tanaffus* (Respiratory system)** نظام تنفس	I	15	16	11
	(a) Mukhtalif tanaffussi aaza ki tamheed (introduction of respiratory system/organs)مختلف تنفسی اجزاء کی تمہید				
	(b) Aaza –i- tanaffys ki Khurd beeni sakht				

	(histological structure) اجزائے تنفسی کی خوردبینی ساخت				
	(c) Uzlaat-e-tanaffuss aur unke afaal (respiratory muscles & functions of respiratory system/organs) عضلات تنفس اور انکے افعال				
	(d) Oxygen aur carbon di oxide ki muntaqeeli (transport of oxygen & carbon dioxide) آکسیجن اور کاربن ڈائی آکسائڈ کی منتقلی				
	(e) Riya aur insaja may gason ka tabadila (gaseous exchange in lungs and tissues) ریہ اور انسجہ میں گیسوں کا تبادلہ				
	(f) Tanaffuss ke marakiz (centers of respiration) تنفس کے مراکز				
	(g) Masnooi tanaffuss aur inke mukhtalif tareeqe (artificial respiration and its methods) مصنوعی تنفس اوران کے مختلف طریقے				
	(h) Jasamat-e-reviya (pulmonary volume) جسمات ریویہ				
	(i) Waqaat-e-reviya (pulmonary capacities) وقعت ریویہ				
	(j) Usre tanaffuss (dyspnoea)عسر تنفس				
	(k) Qillat-e-baad (anoxia) قلت باد				
	(l) Dushwaar-e-tanaffuss (apnoea)دشوار تنفس				
	(m) Izdiyad-e-tanaffuss (hypercapnia)ازدیاد تنفس				
	(n) Sat-he-martafa aur gehre paani ke feliyati asraat (physiological effect of high altitude & under water) سطح مرتفع اور گہرے پانی کے فعلیاتی اثرات				
3.	***Nizam-e-Ikhraj* (Excretory system)** نظام اخراج	II	15	14	11
	(a) Kulliya ki saqht-o-afaal (Structure and function of kidney) کلیہ کی ساخت وافعال				
	(b) Aljihazul mujawiru lilkubaiba (juxta--glomerular apparatus and renin- angiotensin system) الجہازالمجاورہ للکبیبہ اور نطام رینن و انجیوٹنسن				
	(c) Paidaish-e- bowl, tarkeeb-e-bowl, aur miqhdaar-e-bowl (urine formation, quantity & concentration of urine) پیدائش بول ، ترکیب بول اور مقدار بول				
	(d) Renal regulation of fluid and electrolytes and acid-base balance توازن کہارل اور توازن حمضی قلوی میں کلیہ کا کردار				
	(e) iqhraj-i- bowl aur iska mechania (micturition and its mechanism) اخراج بول اور اسکامیکانیہ				
	(f) masana aur uske su-e- afaal (urinary bladder				

	and its abnormalities) مثانہ اور اس کی خرابیاں				
	(g) Artificial kidney, dialysis and renal transplantation مصنوعی کلیہ،ڈائلیسس اورزَرْع الکلیہ				
	(h) Renal function tests اخْتِبار وَظيفَة الكُلْيَة				
	(i) Unani conepts of idrar-e-bowl ادرار بول کا یونانی طبی مَفهُوم				
4.	***Nizam-e-jild* (Integumentary system)** نظام جلد	II	10	04	02
	(a) Jild ki sakht aur afaal (structure and functions of skin) [integument], جلدکی ساخت و افعال				
	(b) Paseena (sweat) پسینہ				
	(c) Hararat-e-badaniya ka tavazun, (regulation of body temperature) حرارت بدنیہ کا توازن				
	(d) Ghair tabiyyee hararat aur qillate-hararat (abnormal and sub-normal temperature). غیر طبعی حرارت و قلت حرارت				
5.	***Nizam-e-Aasab* (Nervous system)** نظام اعصاب	II	15	19	11
	i. Organization of nizam-e-aasab (nervous system)تنظیم نظام اعصاب				
	ii. Naseej-e- asabi (neural tissue)نسیج عصبی				
	iii. Leef-e= asabi (Nerve fibers) لیف عصبیی				
	iv. Mashbak/ittisal (synapse):اتصال/مشبک				
	v. Asabi mursalat (neurotransmitters) عصبی مرسلات				
	vi. Markazi nizam-e- asab (Central nervous system) مرکزی نظام اعصاب				
	vii. Assabeel-o shabkiya hissi (Sensory pathways and tracts) السبیل و شبکیہ حسی				
	viii. Nizam-e-harkiyah (Motor system) نظام حرکیہ				
	ix. Alfailur-rudood (Reflexes)الفعل ردود				
	x. Muqheeqh uqda-e qaidiyyah (Cerebellum & basal ganglia)مخیخ اور عقدہ قعدیہ				
	xi. Nizame asabi la iradi (Autonomic nervous system) الجهاز العصبي اللاإرادي				
	xii. nuqha (Spinal cord)نخاع				
	xiii. maseerutus sailunuqhayi (Cerebero-spinal fluid)مسیرۃ السائل النخاعی				
	xiv. Al naum (Physiology of sleep) النوم				
	xv. Waj-o- alam (Physiology of pain) وجع و الم				
	xvi. EEG & nerve tests				

	xvii. Unani concept of quwwat-e-nafsaniyyah قوت نفسانیہ				
	xviii. Quwwat-e zaiqah wa shammah (the taste and smell sensation) قوت ذائقہ و شامہ				
	xix. Uzn (Ear) اذن				
	xx. Ghisha-e tabli aur azeematusameiyyah (Tympanic membrane and the ossicular system) غشاء طبلی اور عظیمات السمعیہ				
	xxi. Cochlea قوقلیا				
	xxii. Saut (Sound) صوت				
	xxiii. Mechania-e quwwat-e-saut-e-markazi (Central auditory mechanisms) میکانیہ قوت صوت مرکزی				
	xxiv. Hearing test				
	xxv. Eye عین				
	xxvi. Ratubat-e- ain (Fluid system of the eye) رطوبات عین				
	xxvii. Photochemistry of vision الكيمياء الضوئية للرؤية				
	xxviii. Ruyiyat ka mechania (Physiology of vision) رؤیت کا میکانیہ				
	xxix. Harkat-e-ain (Eye movements) حرکات عین				
6.	***Nizam-e-ghudood* la qanatiyah (Endocrine system)**	III	15	19	10
	(a) Ghudood-e-la qanatiyah (endocrine gland) غدودلا قناتیہ				
	(b) Tanzeem-e-afraz rasilat (regulation of hormones) تنظیم افرازرسیلات				
	(c) Rasilat ka mekaniya-i- amal (Mechanism of action of hormones) رسیلات کا میکانیہ عمل				
	(d) Rasilat aur istihala-e- kailshium (Hormones and calcium metabolism) رسیلات اور استحالہ کیلشیم				
	(e) Taht-us-sarir (hypothalamus) تحت السریر				
	(f) Ghudda nukhamiyah (pituitary gland) غدہ نخامیہ				
	(g) Rasila-e-namu (growth hormone) رسیلہ نمو				
	(h) Ghudda-e-nukhmiya muaqqhar (posterior pituitary) غدہ نخامیہ مؤخر				
	(i) Ghudda-e-darqiyyah (thyroid gland) غدہ درقیہ				
	(j) Ghudda-e- kazriyyah (adrenal glands) غدہ کزریہ				
	(k) Banqiras (pancreas):بانقراس				
	(l) Ghudda sa'atariyyah (thymus) and ghhudda-e-sanobariyyah (pineal gland): غدہ صعتریہ اور غدہ صنوبریہ				
	(m)Thyroid function tests				
	(n) Endocrine consequences and metabolism				
7.	***Nizam-e-tauleed* (Reproductive system)**	III	15	14	10
	(a) Sex differentiation & determination				
	(b) Bulooghat (puberty): بلوغت				

	(c) Nizam-e-tauleed mardana (male reproductive system) نظام تولید مردانہ				
	(d) Rasila-e-khusya (testosterone) رسیلہ خصیہ				
	(e) Ghudda-e-madhi(prostate) غدہ مذی				
	(f) Nizame tawleed zanana(female reproductive system)) نظام تولید زنانہ				
	(g) Rasila muwallid-i- bayda (oestrogen) and rasila mu'in al-haml (progesterone): رسیلہ مولد بایئدہ و رسیلہ معین حمل				
	(h) Hamal (pregnancy), wiladat (parturition) & ilban / amal-e-raza'at (lactation) حمل، ولادت و عمل رضاعت				
	(i) Iyas (menopause) ایاس				
	(j) Unani concepts of quwwat-e-tanasulliya قوت تناسلیہ کا طبی مفہوم				
Total				**103**	**62**

Table 2: Contents of Manafeul Aza (Practical)

	A2 List of Topics UNIUG-MZ	B2 Term	C2 Marks	D2 Lecture hours	E2 Non-Lecture hours
1	**General physiology**	I	18		76
	Stethoscope				
	Microscope				
	Body Temperature				
2	**Respiratory System**	I	12		20
	Respiratory sounds				
	Lung volume/ capacities				
3	**Digestive System**	I	10		12
	BMI				
	Bowel sounds				
4	**Haematology**	II	16		70
	Types of blood samples				
	Blood Plasma				
	Serum				
	Blood cells				
	Erythrocytes				
	Leucocytes				
	Haemoglobin				
	Blood groups				
	Blood Indices				
5	**Urology**	II	14		36
	Physical examination of urine				
	Microscopic examination of urine				
	Chemical examination of urine				

6	**Cardio vascular system**	III	14		32
	Radial pulse				
	Blood Pressure				
	ECG				
	Heart sounds				
7	**Nervous System**	III	8		20
	EEG				
	NCT				
8	**Special Senses**	III	8		14
	Perimetry				
	Visual acuity				
	Colour vision				
	Conduction of sound				
Total					**280**

Table 3: Learning objectives of Manafeul Aza UNIUG-MZ - Paper – I (Theory)

A3 Course outcome	B3 Learning Objective (At the end of the session, the Students should be able to)	C3 Domain/Sub	D3 Must to know/desirable to know/Nice to know	E3 Level Does/shows / Knows how/ Knows	F3 T-L method	G3 Assessment	H3 Formative /summative	I3 Term	J3 Integration
Topic 1- Umoomi Manafeul Aza (general physiology) (Lecture:- 09 hours, Non lecture 05hour)									
CO1	Define Manafeul Aza	Cognitive/Recall	MK	K	Lecture	Written/ viva- voce	F & S	I	
CO1	Explain Homeostasis and its significance	Cognitive/Recall	MK	KH	Lecture / Small group discussion	Written/ Open Book Test,	F & S		
CO2, CO3	Describe transport across cell membrane	Cognitive/Recall	MK	KH	Lecture/ Educational videos	Written/ viva- voce	F & S	I	
CO2, CO3	Explain Action potential	Cognitive/Recall	MK	KH	Lecture	Written/ viva- voce	F & S	I	
CO2, CO3	Describe muscle physiology	Cognitive/Recall	MK	KH	Lecture/symposium	Written/ viva- voce	F & S	I	
CO2, CO3	Describe structure and biochemistry of macromolecules	Cognitive/Recall	MK	K	Lecture	Written/ viva- voce	F & S	I	
CO2, CO3	Explain protein synthesis	Cognitive/Recall	MK	K	Lecture/ Tutorials	Written/ viva- voce	F & S	I	

CO2, CO3, CO4	Describe Acid-base balance	Cognitive/Recall	MK	K	Lecture/ Small group discussion/ PBL	Written/ viva- voce	F & S	I	
CO2, CO3, CO4	Describe water balance	Cognitive/Recall	MK	K	Lecture/ Small group discussion	Written/ Project Work	F & S	I	
Topic 2- Study of Khulia and Insaja (Cytology and Histology) (Lecture:- **09** hours, Non lecture **06**hours)									
CO2	Explain cytology and histology	Cognitive/Recall	MK	K	Lecture	Written	F & S	I	
CO2	Explains in detail about the structure and functions of the Khulia (cell)	Cognitive/Recall	MK	K	Lecture/ symposium	Written	F & S	I	
CO2	Describes the Taqseem-e-Khulia (cell division)	Cognitive/Recall	MK	KH	Lecture/discussion/ symposium	Written	F & S	I	
CO2, CO5	Gene mutations, Chromosomal aberrations	Cognitive/Recall	MK	KH	Lecture/discussion/ symposium	Written	F & S	I	
CO2	Define and classify the cell junctions	Cognitive/Recall	NK	K	Lecture/symposium	Written /viva voce	F	I	
CO1, CO2	Explain about the cell death	Cognitive/comprehensions	DK	KH	Lecture/discussion	Written/viva Voce	F & S	I	
CO2	Define and classify the Insaja	Cognitive/Recall	MK	K	Lecture	Written	F & S	I	
CO2	Describe the structure and functions of Naseej-	Cognitive/comprehens	MK	K	Lecture/ symposium	Written	F & S	I	

	e-Bashri (Epithelial tissues)	ions							
CO2	Describe the structure and functions of Naseej-e-Wasil (connective tissues)	Cognitive/comprehensions	MK	K	Lecture/ symposium	Written	F & S	I	
CO2	Describe the structure and functions of Naseej-e-Azli (muscle tissues)	Cognitive/comprehensions	MK	K	Lecture/ symposium	Written	F & S	I	
CO2	Describe the structure and functions of Naseej-e-Asbi (nervous tissues)	Cognitive/comprehensions	MK	K	Lecture/ symposium	Written	F & S	I	
Topic 3-*Khoon wa Nizam-i-Damwi* (Blood & Haemopoetic System) (Lecture:- **30** hours, Non lecture **15**hours)									
CO2	Define the Khoon and explain its properties, compositions and functions	Cognitive/ Recall	MK	K	Lecture	Written	F & S	II	
CO2	Describe the Sayyal-e-Damwi Lahmi (plasma proteins)	Cognitive/ comprehensions	MK	K	Lecture/symposium	Viva voce	F & S	II	
CO2	Differentiate between plasma and serum	Cognitive/ comprehensions	MK	KH	Group discussion	Written/Viva voce	F&S	II	
CO2	Describe the structure and morphology of	Cognitive/ comprehe	MK	K	Lecture/discussion	Written/ Viva voce	F & S	II	

	Kurriyat-i-Hamra (RBCs)	nsions							
CO2	Explain the properties of Kurriyat-i-Hamra	Cognitive/ comprehe nsions	MK	K	Lecture/symposium	Written/ Viva voce	F & S	II	
CO2	Define and Describe the synthesis of Kurriyat-i-Hamra (Erythropoiesis)	Cognitive/ Recall	MK	K	Lecture/symposium	Written/ Viva voce	F & S	II	
CO2	Describe the site for Erythropoiesis in foetus and adult	Cognitive/ comprehe nsions	DK	K	Educational video /Lecture/discussion	Written/ Viva voce	F & S	II	
CO2, CO4	Enumerate the factors necessary for Erythropoiesis	Cognitive/ Recall	MK	K	Lecture/discussion	Viva voce	F & S	II	
CO2, CO4	Describe regulation of Erythropoiesis	Cognitive/ comprehe nsions	MK	KH	Lecture/discussion	Viva voce	F & S	II	
CO2	Explain the lifespan and the fate of Kurriyat-i-Hamra	Cognitive/ comprehe nsions	MK	K	Lecture/PBL	Written/ Viva	F & S	II	
CO2	Describes the functions of Kurriyat-i-Hamra	Cognitive/ comprehe nsions	MK	K	Lecture/	Written/ Viva	F & S	II	
CO1, CO2, CO5	Explain the physiological & pathological variations in number of RBCs	Cognitive/ comprehe nsions	MK	Kh	Lecture/PBL	Written/ Viva	F & S	II	

CO2, CO3	Define and classify the Faqrud-Dum (anaemia)	Cognitive/ Recall	MK	K	Lecture/symposium	Written/ Viva	F & S	II	
CO1, CO2	Explain the morphological variations of RBCs	Cognitive/ comprehe nsions	MK	Kh	Lecture	Written/ Viva	F & S	II	
CO4	Explain the Applied physiology of ESR	Cognitive/ comprehe nsions	MK	Kh	Small group discussion	Written/ Viva	F & S	II	
CO4	Explain the applied physiology of packed cell volume	Cognitive	MK	K	Small group discussion	Written/ Viva	F & S	II	
CO4,	Define and explain in detail about the blood indices	Cognitive	NK	K	Small group discussion	Written/ Viva	F & S	II	
CO2	Explain the structure & functions of Hamratud-Dum (Haemoglobin)	Cognitive/ Recall	MK	K	Lecture/concept map	Written/ Viva	F & S	II	
CO2	Describe the synthesis of Hamratud-Dum	Cognitive/ Recall	MK	K	Video clip /Lecture	Written/ Viva	F & S	II	
CO2, CO3	Fate/destruction of Hamratud-Dum	Cognitive/ Recall	MK	K	Lecture	Written/ Viva	F & S	II	
CO2	Explain the types of Hamratud-Dum	Cognitive/ Recall	MK	K	Lecture	Written/ Viva	F & S	II	
CO5	Explain the disorders related to Hamratud-Dum	Cognitive/ comprehe nsions	DK	Kh	PBL/discussion	Written/ Viva	F & S	II	
CO2	Define & classify the Kurriyat-e-Baiza (white	Cognitive/	MK	K	Lecture	Written/ Viva	F & S	II	

	blood cells)	Recall							
CO2	Explain the morphology of Kurriyat-e-Baiza	Cognitive/ comprehe nsions	MK	Kh	Concept map/Lecture	Written	F & S	II	
CO2	Describe the formation of Kurriyat-e-Baiza (leucopoiesis)	Cognitive/ comprehe nsions	DK	Kh	Lecture	Written	F & S	II	
CO6, CO8	Describe the normal values of total leucocytes count and differential leucocytes count	Cognitive/ comprehe nsions	MK	Kh	Symposium	Written/ Viva	F & S	II	
CO2	Describe the properties & functions of Kurriyat-e-Baiza	Cognitive/ Recall	MK	K	Lecture/symposium	Written/ Viva	F & S	II	
CO2, CO4, CO5	Explain the physiological & pathological variations of Kurriyat-e-Baiza	Cognitive/ Recall	MK	K	Lecture	Written/ Viva	F & S	II	
CO6, CO9	Explain and demonstrate Sahli's hemoglobinometer	Cognitive/ comprehe nsions	MK	S	Lecture/ Demonstration/ practical	Viva	F & S	II	
CO2, CO3	Define & classify the Mana-at (Immunity)	Cognitive/ Recall	MK	K	Lecture	Written/ Viva	F & S	II	
CO2, CO3	Define & describe the types of antigen	Cognitive/ Recall	DK	K	Lecture/Project work	Written/ Viva	F & S	II	
CO2, CO3	Describe the development of cell	Cognitive/ comprehe	MK	Kh	Lecture	Written/	F & S	II	

	mediated immunity	nsions				Viva			
CO2, CO3	Describe the development of humoral immunity	Cognitive/ comprehe nsions	MK	Kh	Lecture	Written/ Viva	F & S	II	
CO2, CO3	Define and describe the types of cytokines	Cognitive/ comprehe nsions	DK	Kh	Lecture/discussion	Written/ Viva	F & S	II	
CO2, CO7, CO8	Explain in detail about immunization	Cognitive/ comprehe nsions	NK	Kh	Lecture/small group discussion	Written/ Viva	F & S	II	
CO5, CO7, CO8	Explain & compare the immune deficiency diseases & autoimmune diseases	Cognitive/ comprehe nsions	NK	Kh	Lecture/PBL	Viva	F & S	II	
CO2, CO4, CO5	Explain in detail about allergy & immunological hypersensitive reactions	Cognitive/ comprehe nsions	NK	Kh	Lecture/discussion	Written/ Viva	F & S	II	
CO2, CO6	Define & describe the normal value, structure and composition of Aqras-e-Damwiya (platelets)	Cognitive/ Recall	MK	K	Lecture	Written/ Viva	F & S	II	
CO2	Describe the properties of platelets	Cognitive/ Recall	MK	K	Lecture/ seminar	Written/ Viva	F & S	II	
CO2	Describe the functions of platelets	Cognitive/ Recall	MK	K	Lecture	Written/ Viva	F & S	II	
CO2, CO3,	Explain the physiological	Cognitive/	MK	K		Written/	F & S	II	

CO4, CO6	variations in number of platelets	Recall			Lecture	Viva			
CO2	Explain the formation of platelets	Cognitive/ Recall	MK	K	Lecture	Written/ Viva	F & S	II	
CO1, CO2	Explain the lifespan & fate of platelets	Cognitive/ Recall	MK	K	Lecture/discussion	Written/ Viva	F & S	II	
CO4, CO5	Describe the applied physiology of platelets	Cognitive/ Recall	DK	K	Lecture/discussion	Written/ Viva	F & S	II	
CO1, CO2	Define & explain the stages of Haemostasis	Cognitive/ Recall	MK	K	Lecture	Written/ Viva	F & S	II	
CO1, CO2	Define & explain Injimadud-Dam (coagulation of blood) and blood clotting factors	Cognitive/ Recall	MK	K	Lecture/symposium	Written/ Viva	F & S	II	
CO1, CO2	Explain in detail about the stages of blood clotting	Cognitive/ comprehe nsions	MK	K	Lecture/discussion	Written/ Viva	F & S	II	
CO1, CO6, CO8	Define & explain the blood clot, clot retraction and fibrinolysis	Cognitive/ comprehe nsions	MK	K	Lecture	Written/ Viva	F & S	II	
CO1, CO3, CO7	Describe the mechanism preventing intravascular blood clotting	Cognitive/ comprehe nsions	MK	K	Lecture	Written/ Viva	F & S	II	
CO1, CO5,	Explain in detail about thrombosis	Cognitive/ comprehe	DK	K	Lecture	Written/	F & S	II	

CO8		nsions				Viva			
CO4, CO8	Explain in detail about Haemophilia, purpura and von willebrand disease	Cognitive/ comprehe nsions	DK	Kh	Lecture/PBL	Written/ Viva	F & S	II	
CO6, CO7, CO8, CO9	Describe in detail about the Khoon ki girohbandi (various blood grouping system)	Cognitive/ comprehe nsions	MK	Kh	Lecture/symposium	Written/ Viva	F & S	II	
CO6, CO8 CO9	Demonstrate the procedure of blood grouping & determine the ABO group	Psychomo tor	MK	S	Lecture/Practical/ Demonstration	Written/ Viva Practical	F & S	II	
CO6, CO8	Define & explain in detail about the blood transfusion	Cognitive/ Recall	MK	K	Lecture/symposium	Written/ Viva	F & S	II	
CO4	Explain in detail about the transfusion reactions	Cognitive/ comprehe nsions	MK	Kh	Lecture/discussion	Written/ Viva	F & S	II	
CO4	Explain about the Rh incompatibility & its complications in fetus	Cognitive/ comprehe nsions	MK	Kh	Lecture/Small group discussion	Written/ Viva	F & S	II	
CO6, CO7, CO8	Describe the exchange transfusion & autologous blood transfusion	Cognitive/ comprehe nsions	MK	Kh	Lecture/PBL	Written/ Viva	F & S	II	

Topic 4- *Nizam-e-Urooq-e-Lymphavia aur Shabki-o-Bashree Baatini* **(Lymphatic & Reticulo-endothelial system)**

(Lecture:- **03** hours Non lecture **02**hours)

CO2	Define and explain Nizam Urooq-e-Limfavia (lymphatic system)	Cognitive/ Recall	MK	K	Lecture	Written	F & S	II	
CO2	Explain the composition & formation of Rutubat-e-Lymphavia (lymph)	Cognitive/comprehensions	MK	Kh	Lecture/ discussion	Written/ Viva voce	F & S	II	
CO1, CO2, CO4	Describe in detail about the lymphatic channel & drainage of lymphatic system	Cognitive/comprehensions	MK	Kh	Lecture/Small group discussion	Written/viva	F & S	II	
CO2, CO4	Explain the structure & functions of lymph nodes/glands	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	II	
CO2, CO8	Define & explain the Nizam-e-Shabki-o-Bashree Baatini (Reticuloendothelial System)	Cognitive/ Recall	MK	Kh	Lecture/symposium	Written	F & S	II	
CO2	Classify the reticulo-endothelial cells	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	II	
CO2	Explain the functions of reticulo-endothelial system	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	II	

CO2	Describe the structure & functions of Tihal (spleen)	Cognitive/comprehensions	MK	Kh	Lecture	Written	F & S	II	
Topic 5- *Nizam-e-Dauran-e-Khoon* (Circulatory system)(Lecture:- **23** hours, Non lecture **15**hours)									
CO2	Describe the functional anatomy of the Qalb (heart) including the chambers and layers of heart wall	Cognitive/Recall	MK	K	Lecture/symposium	Written/viva	F & S	III	
CO2, CO4, CO5	Explain the Samamat-e-Qalb (valves of heart) & its applied physiology	Cognitive/Recall	MK	K	Lecture/symposium / Discussion	Written/viva	F & S	III	
CO2	Explain in detail about systemic circulation, pulmonary circulation and coronary circulation	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO2	Describe foetal circulation	Cognitive/comprehensions	NK	Kh	Small group discussion	Written/viva	F & S	III	
CO2	Describe in detail of properties of cardiac muscle	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO2, CO4,	Define & explain in detail about the	Cognitive/Recall	MK	K	Lecture/symposium	Written/viva	F & S	III	

	Daura-e-Qalbi (cardiac cycle)								
CO2, CO4, CO8	Describe in detail about the Aswat-e-Qalb (heart sounds) including normal & abnormal	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	
CO2, CO6, CO9	List the methods of study of heart sounds	Cognitive/Recall	MK	K	Lecture/Practical/ Demonstration	Written/viva Practical	F & S	III	
CO2, CO8	Explain and demonstrate the auscultation areas	Cognitive/Recall	MK	K	Lecture/ demonstration	Written/viva practical	F & S	III	
CO2	Describe in detail about the components of conductive system of the heart/junctional tissues of the heart	Cognitive/Recall	MK	K	Lecture	Written/viva	F & S	III	
CO2, CO4, CO5	Describe the heart rate & its Physiological & pathological variations	Cognitive/comprehensions	MK	Kh	Lecture/Tutorial	Written/viva	F & S	III	
CO2, CO4,	Describe regulation of heart rate	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1, CO2	Explain the vasomotor center	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1,	Explain the factors	Cognitive/c		Kh				III	

CO2	affecting the vasomotor center	omprehens ions	MK		Lecture/discussion	Written/viva	F & S		
CO1, CO2	Define the baroreceptors & chemoreceptors and explain their role on heart rate	Cognitive/R ecall	MK	K	Lecture/discussion	Written/viva	F & S	III	
CO2, CO4, CO5	Define & Explain in detail about the venous return, and cardiac output	Cognitive/R ecall	MK	K	Lecture	Written/viva	F & S	III	
CO2, CO6 CO8	Describe the stroke volume, minute volume, ejection fraction	Cognitive/c omprehens ions	MK	Kh	Lecture/ Tutorial	Written/viva	F & S	III	
CO2, CO8	Describe the end-systolic volume & end-diastolic volume	Cognitive/c omprehens ions	MK	Kh	Lecture	Viva voce	F & S	III	
CO2, CO4	Describe the physiological variations and regulation of cardiac output.	Cognitive/c omprehens ions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	
CO2, CO5, CO8	Describe the heart block	Cognitive/c omprehens ions	NK	K	Lecture/symposium	Written/viva	F & S	III	
CO2, CO5	Describe the circulatory shock and heart failure	Cognitive/c omprehens ions	NK	K	Lecture/discussion	Open Book Test/ viva voce	F & S	III	
CO5	Describe the pathophysiology of	Cognitive/c	DK	Kh	Small group	Written/viva	F & S	III	

	various types of shock and syncope	omprehens ions			discussion /Self-directed learnings				
CO6, CO9, CO10	Define & explain the Barqi Qalb Nigari (Electrocardiography) (ECG)	Cognitive/Recall	MK	K	Lecture	Written/viva	F & S	III	
CO7, CO8	Describe the significance/usage of the ECG	Cognitive/comprehensions	MK	K	Lecture/Project work	Written/viva	F & S	III	
CO6, CO8	Describe the ECG grid, ECG leads	Cognitive/comprehensions	MK	K	Lecture	Written/viva	F & S	III	
CO6, CO8	Describe the waves of normal ECG, Intervals & segments of ECG	Cognitive/comprehensions	MK	K	Lecture/discussion	Written/viva	F & S	III	
CO6, CO9	Illustrate the Normal ECG with electrocardiograph	Psychomotor	MK	S	Lecture/ Practical/ Demonstration	Written/viva	F & S	III	
CO5 CO6 CO7 CO8	Describe the abnormal ECG, Arrhythmias, heart block, and Myocardial changes	Cognitive/comprehensions	MK	K/KH	Small group discussion /PBL	Written/viva	F & S	III	
CO2, CO8	Define the Fisharud-Dam (Blood pressure)	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1, CO2, CO4	Explain the physiological variations of blood	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	

	pressure								
CO1, CO2, CO4	Describe the factors maintaining the blood pressure	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	III	
CO1, CO2, CO7	Explain in detail about various mechanism for regulation of blood pressure	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	III	
CO4, CO5, CO7	Explain the pathological variations of blood pressure (hypertension & hypotension)	Cognitive/comprehensions	DK	Kh	Lecture/discussion	Written/viva	F & S	III	
CO6, CO9,	Describe the methods for blood pressure measurement	Cognitive	MK	KH	Lecture/discussion	Viva voce	F & S	III	
Topic 6- *Hayateen* (Vitamins) (Lecture:- **06** hours, Non lecture **04** hours)									
CO2	Define & describe the Hayateen (Vitamins)& describe history & discovery of vitamins	Cognitive/Recall	MK	K	Lecture/Tutorial	Written/viva	F	II	
CO2	Classify the vitamins	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	II	

CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin A	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to Vitamin A	Cognitive/comprehensions	MK	Kh	Lecture/discussion/ PBL	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin D	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to Vitamin D	Cognitive/comprehensions	MK	Kh	Lecture/discussion/ PBL	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin E	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to	Cognitive/comprehens	MK	Kh	Lecture/discussion	Written/viva	F & S	II	

	Vitamin E	ions							
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin K	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to Vitamin K	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin C	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to Vitamin C	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, &biochemical functions of Vitamin B-1 (thiamine)	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	II	

CO5	Describe the Disorders related to VitaminB-1 (thiamine)	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin B-2 (riboflavin)	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to Vitamin B-2 (riboflavin)	Cognitive/Recall	MK	K	Lecture/discussion	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin B-3 (Niacin)	Cognitive/Recall	MK	K	Lecture/symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to Vitamin B-3	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	II	

	requirements, & biochemical functions of Vitamin B-5 (Pantothenic acid)								
CO5	Describe the Disorders related to Vitamin B-5 (Pantothenic acid)	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin B-6 (Pyridoxine)	Cognitive/comprehensions	MK	Cognitive/comprehensions	Lecture/symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to Vitamin B-6 (Pyridoxine)	Cognitive/comprehensions	MK	Cognitive/comprehensions	Lecture/ discussion	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin B-7 (Biotin)	Cognitive/comprehensions	MK	Kh	Lecture/ symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to	Cognitive/comprehens	MK	Kh	Lecture/ discussion	Written/viva	F & S	II	

	Vitamin B-7(Biotin)	ions							
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin B-9 (Folate/folic acid)	Cognitive/comprehensions	MK	Kh	Lecture/ symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to Vitamin B-9 (Folate/folic acid)	Cognitive/comprehensions	MK	Kh	Lecture/ discussion	Written/viva	F & S	II	
CO2, CO6	Explain in detail about the chemistry, dietary sources, daily requirements, & biochemical functions of Vitamin B-12 (Cobalamin)	Cognitive/comprehensions	MK	Kh	Lecture/ symposium	Written/viva	F & S	II	
CO5	Describe the Disorders related to Vitamin B-12 (Cobalamin)	Cognitive/comprehensions	MK	K	Lecture/ discussion	Written/viva	F & S	II	
CO5, CO7	Demonstrate common causes of deficiencies, Good food habits, healthy cooking tips to prevent	Psychomotor	NK	S	PBL/ activity learning	Written/viva	F & S	II	

	deficiencies.								
Topic 7- *Istihala* (Metabolism) (Lecture:- **17** hours, Non lecture **11** hours)									
CO1 CO2 CO3	Describe the introduction of Istihala (metabolism) & its types	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Explain Istihala Qa'idi (BMR), SDA, RQ, ATP, calorific value.	Cognitive/comprehensions	MK	Kh	Lecture/ symposium	Written/viva	F & S	III	
CO1 CO2 CO3	Describe in detail about the Istihala of Nishasta (metabolism of carbohydrate)	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Describe in detail about the Glycolysis	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	III	
CO1 CO2 CO3	Explain in detail about the pyruvate dehydrogenase complex & its reactions	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Describe in detail about the Citric acid cycle	Cognitive/comprehensions	MK	Kh	Lecture/symposium	Written/viva	F & S	III	
CO1 CO2 CO3	Explain about the Gluconeogenesis	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	

CO1 CO2 CO3	Explain about the Glycogenesis	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Describe the Glycogenolysis	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Describe the Hexose Monophosphate Shunt	Cognitive/comprehensions	MK	Kh	Small group discussion/PBL	Written/viva	F & S	III	
CO4 CO5	Describe the disorders related to carbohydrate metabolism	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	
CO1 CO2 CO3	Describe in detail about the Istihala of Shahmiyat (Metabolism of Lipids)	Cognitive/comprehensions	MK	Kh	Lecture, problem based learning	Written/viva	F & S	III	
CO2, CO4, CO8	Explain Beta oxidation	Cognitive/comprehensions	MK	Kh	Lecture	written/ viva voce	F & S,	III	
CO1 CO2 CO3	Describe the Triglycerols and body lipids	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Explain the mobilisation of fats from adipose tissues	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	
CO1 CO2 CO3	Describe the fate of glycerol & fatty acid	Cognitive/comprehens	NK	Kh	Lecture/discussion	Written/viva	F & S	III	

		ions							
CO1 CO2 CO3	Explain in detail about the Fatty acid oxidation	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Describe the ketone bodies & ketogenesis	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	
CO1 CO2 CO3 CO5	Describe the utilization & overproduction of ketone bodies	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	
CO4 CO5	Describe in detail about the ketonaemia, ketonuria, ketosis & ketoacidosis	Cognitive/comprehensions	MK	Kh	Lecture/Tutorial	Written/viva	F & S	III	
CO1 CO2 CO3	Explain in detail about the biosynthesis of fatty acids	Cognitive/comprehensions	DK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3 CO5	Explain in detail about the synthesis & degradation of cholesterol	Cognitive/comprehensions	NK	Kh	Lecture	Written/viva	F & S	III	
CO5	Describe the disorders of cholesterol	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Explain in detail about the Lipoproteins and its classification	Cognitive/comprehensions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	
CO5	Describe the	Cognitive/c		Kh	Lecture/discussion	Viva voce		III	

	disorders of plasma lipoproteins	omprehens ions	DK				F & S		
CO1 CO2 CO3	Describe the lipotropic factors	Cognitive/c omprehens ions	NK	Kh	Lecture	Written/viva	F & S	III	
CO4 CO5 CO6	Describe the siman-i-mufrat (obesity) & muasshir kullatul jism (BMI)	Cognitive/c omprehens ions	MK	Kh	Lecture	Written/viva	F & S	III	
CO4 CO5	Describe the atherosclerosis & its association with cholesterol and lipoproteins	Cognitive/c omprehens ions	DK	K	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Describe in detail about the Istihala-e- Humooze Shorain (Metabolism of amino acids)	Cognitive/c omprehens ions	MK	Kh	Lecture/symposium	Written/viva	F & S	III	
CO1 CO2 CO3	Describe about the proteins & amino acid pool	Cognitive/c omprehens ions	DK	Kh	Lecture	Written/viva	F & S	III	
CO1 CO2 CO3	Explain in detail about the Transamination	Cognitive/c omprehens ions	MK	Kh	Lecture/Tutorial	Written/viva	F & S	III	
CO1 CO2 CO3	Explain in detail about the Deamination	Cognitive/c omprehens ions	MK	Kh	Lecture/discussion	Written/viva	F & S	III	
CO1	Describe in detail	Cognitive/c		Kh		Written/viva		III	

CO2 CO3	about metabolism of ammonia	omprehens ions	MK		Lecture/discussion		F & S		
CO1 CO2 CO3	Describe in detail about the Urea cycle	Cognitive/c omprehens ions	MK	Kh	Lecture/symposium	Written/viva	F & S	III	
CO1 CO2 CO3	Describe about the blood urea & its importance	Cognitive/c omprehens ions	DK	Kh	Lecture	Viva voce	F & S	III	
CO1 CO2 CO3	Describe istihala-e-Madniyat aur istihala-e-ma'a (mineral and water metabolism).	Cognitive/c omprehens ions	DK	Kh	Lecture	Written/viva	F & S	III	

Table 3: Learning objectives of Manafeul Aza UNIUG-MZ - Paper – II (Theory)

A3 Course outcome	**B3 Learning Objective (At the end of the session, the Students should be able to)**	**C3 Domain/Sub**	**D3 Must to know/desirable to know/Nice to know**	**E3 Level Does/shows / Knows how/ Knows**	**F3 T-L method**	**G3 Assessment**	**H3 Formative /summative**	**I3 Term**	**J3 Integration**
Topic 1-Nizam-i-Hazm(Digestive system) (Lecture:- **17** hours, Non lecture **07**hours)									
CO8	Describe Tamheed-e-nizam-e-hazm (introduction of digestive system),	Cognitive/c omprehens ions	MK	Kh	Lecture	written/ viva voce	F	I	
CO2	Explain Functional	Cognitive/c	MK	Kh	Lecture/ Video Clip	written/ viva	F & S	I	

	anatomy of primary digestive organs	omprehens ions				voce			
CO2	Describe Functional anatomy of oesophagus	Cognitive/c omprehens ions	MK	Kh	Lecture/ displaying photos on ppt	written/ viva voce	F & S	I	
CO2	Describe Functional anatomy of stomach	Cognitive/c omprehens ions	MK	Kh	Lecture/ displaying photos on ppt	written/ viva voce	F & S	I	
CO2	Describe Functional anatomy of small intestines,	Cognitive/c omprehens ions	MK	Kh	Lecture/ displaying photos on ppt	written/ viva voce	F & S	I	
CO2	Describe Functional anatomy of large intestines	Cognitive/c omprehens ions	MK	Kh	Lecture/ displaying photos on ppt	written/ viva voce	F & S	I	
CO2	Describe Functional anatomy of secondary digestive organs -salivary glands,)	Cognitive/c omprehens ions	MK	Kh	Lecture/ Educational Videos/ concept map	written/ viva voce	F & S	I	
CO2	Describe Functional anatomy of teeth,	Cognitive/c omprehens ions	DK	Kh	Lecture/ displaying photos on ppt	written/ viva voce	F & S	I	
CO2	Describe Functional anatomy of liver,	Cognitive/c omprehens ions	MK	Kh	Lecture/ displaying photos on ppt	written/ viva voce	F & S	I	
CO2	Describe Functional anatomy of gall bladder,	Cognitive/c omprehens ions	DK	Kh	Lecture/ displaying photos on ppt	written/ viva voce	F & S	I	
CO2	Describe Functional anatomy of pancreas	Cognitive/c omprehens	MK	Kh	Lecture/ displaying photos on ppt	written/ viva voce	F & S	I	

		ions							
CO2,CO 8, CO9	Demonstrate Ghudood-e-luabiya ki Khurd beeni saqht (histology of salivary glands),	Psychomotor	MK	S	Demonstration/microscopy/practical	written/ viva voce	F & S	I	
CO2	Explain Luab-e-dahan ki Khususiyat aur tarkeeb (characteristics & composition of saliva)	Cognitive/comprehensions	MK	Kh	Lecture,	written/ viva voce	F & S	I	
CO3	Describe Luab-e-dahan ke tarashshoh ki tanzeem aur afaal (regulation of secretion of saliva and functions),	Cognitive/comprehensions	MK	Kh	Lecture/ concept map	written/ viva voce	F & S	I	
CO4	Explain Luab-e-dahan ki itlaqi ehmiyat (applied physiology of saliva)	Cognitive/comprehensions	MK	Kh	Lecture/Tutorial	written/ viva voce	F & S	I	
CO2, CO8, CO9	Demonstrate Ghudood-e-meddi ki khurd beeni saqht (histology of gastric glands),	Psychomotor	NK	S	Demonstration/ practical/ lecture,	written/ viva voce	F & S	I	
CO2	Describe Rutubat-e-medi ki khususiyat aur tarkeeb	Cognitive/comprehensions	MK	Kh	Lecture	written/ viva voce	F & S	I	

	(characteristics & composition of gastric juice)								
CO3	Explain Rutubat-e-medi ke tarashshoh ki tanzeem aur afaal (regulation of secretion and functions of gastric juice),	Cognitive/comprehensions	MK	Kh	Lecture	written/ viva voce	F & S	I	
CO4	Describe Rutubat-e-medi ki itlaqi ehmiyat (applied physiology of gastric juice)	Cognitive/comprehensions	NK	Kh	Lecture	written/ viva voce	F & S	I	
CO2	Demonstrate Banqiras ki Khurd beeni saqht (histology of pancreas),	Psychomotor	MK	S	Demonstration/ practical/ lecture, Display of photos of histological slides	written/ viva voce	F & S	I	
CO2	Describe Rutubat-e-banqras ki Khususiyat aur tarkeeb (characteristics & composition of pancreatic juice)	Cognitive/comprehensions	MK	Kh	Lecture	written/ viva voce	F & S	I	
CO3	Explain Rutubat-e-banqiras ke tarashshoh ki tanzeem aur afaal (regulation of secretion and	Cognitive/comprehensions	MK	Kh	Lecture	written/ viva voce	F & S	I	

	functions of pancreatic juice),								
CO4	Describe Rutubat-e-banqiras ki itlaqi ahmiyat (applied physiology of pancreatic juice)	Cognitive/comprehensions	MK	Kh	Lecture/ small group teaching	written/ viva voce	F & S	I	
CO2	Describe Rutubat-e-safravi ki khususiyat aur tarkeeb (characteristics & composition of bile)	Cognitive/comprehensions	MK	Kh	Small group discussion	written/ viva voce	F & S	I	
CO2	Explain Rutubat-e-safravi ke tarashshoh ki tanzeem aur afaal (regulation of secretion and functions of bile),	Cognitive/comprehensions	MK	Kh	Lecture/ concept map	written/ viva voce	F & S	I	
CO3	Describe Rutubat-e-safravi ki itlaqi ahmiyat (applied physiology of bile)	Cognitive/comprehensions	MK	Kh	Self-study/ lecture	written/ viva voce	F & S	I	
CO4	Explain Rutubat-e-mayvi ki tarkeeb, tarassho aur afaal (composition, regulation of secretion and functions of succus entericus)	Cognitive/comprehensions	MK	Kh	Lecture/ small group teachings	written/ viva voce	F & S	I	
CO2, CO3,	Describe Majra-e-ghizai ki harkat	Cognitive/comprehens	MK	Kh	Lecture/ Educational Video	written/ viva voce	F & S,	I	

CO4, CO8	(movements of alimentary canal) – mastication: definition, Muscles of mastication, mechanism, benefits of prolong chewing & applied physiology.	ions							
CO2, CO3, CO4, CO8	Explain Amal-i-izdrad (Deglutition: definition, phases & applied physiology, safe deglutition tips)	Cognitive/comprehensions	MK	Kh	Lecture Display of animation video clips,	written/ viva voce	F & S,	I	
CO2, CO3, CO4, CO8	Describe Movements of oesophagus & their applied physiology	Cognitive/comprehensions	MK	Kh	Lecture, display of animation video clips	written/ viva voce	F & S,	I	
CO2, CO3, CO4, CO8	Describe Movements of stomach & their applied physiology	Cognitive/comprehensions	MK	Kh	Lecture, display of animation video clips	written/ viva voce	F & S,	I	
CO2, CO3, CO4, CO8	Describe Qai (Vomiting): definition, causes, types series of events during vomiting, home management tips	Cognitive/comprehensions	MK	Kh	Lecture, display of animation video clips	written/ viva voce	F & S,	I	
CO2, CO3,	Explain Movements of small intestines	Cognitive/comprehens	MK	Kh	Lecture, display of animation video	written/ viva voce	F & S	I	

CO4, CO8	& their applied physiology	ions			clips				
CO2, CO3, CO4, CO8	Describe Movements of colon & their applied physiology	Cognitive/comprehensions	MK	Kh	Lecture, display of animation video clips	written/ viva voce	F & S, Questionnaire	I	
CO2, CO3, CO4, CO8	Explain Fuzla ka banna aur iqhraj (formation of faeces and defecation),	Cognitive/comprehensions	MK	Kh	Lecture, display of animation video clips	written/ viva voce	F & S	I	
CO2	Describe Nishashta ka hazm aur injezab (digestion & absorption of carbohydrates),	Cognitive/comprehensions	MK	Kh	Lecture/ small group discussion	written/ viva voce	F & S	I	
CO2	Describe Shorain ka hazm aur injezab (digestion & absorption of proteins)	Cognitive/comprehensions	MK	Kh	Lecture/ symposium	written/ viva voce	F & S	I	
CO2	Describe Sheham ka hazm aur injezab (digestion & absorption of lipids)	Cognitive/comprehensions	MK	Kh	Lecture/symposium	written/ viva voce	F & S	I	
CO2	Describe Paani ka injezab (absorption of water).	Cognitive/comprehensions	MK	Kh	Lecture/project work	written/ viva voce	F & S	I	
Topic 2- Nizam-e-Tanaffuss (Respiratory System) (Lecture:- **16** hours, Non lecture **11** hours)									
CO8	Describe Mukhtalif tanaffussi aaza ki	Cognitive/c	MK	Kh	Lecture	written/ viva voce	F & S	I	

	tamheed (introduction of respiratory system/organs)	omprehens ions							
CO2	Describe and Demonstrate Azlaat-e-tanaffuss ki Khurd beeni sakht aur unke afaal (histological structure & functions of respiratory muscles),	psychomotor	MK	S	Demonstration, Display of histological slides	written/ viva voce	F & S	I	
CO2	Explain Tanaffus ka meekaniyah (mechanism of breathing)	Cognitive/c omprehens ions	MK	Kh	Video clips	written/ viva voce	F & S	I	
CO2, CO3	Demonstrate Oxygen aur carbon di oxide ki muntaqeeli (transport of oxygen & carbon dioxide),	Cognitive/c omprehens ions	MK	Kh	Lecture, display of animation video clips	written/ viva voce	F & S	I	
CO2, CO3	Describe Riya aur insaja may gason ka tabadila (gaseous exchange in lungs and tissues),	Cognitive/c omprehens ions	MK	Kh	Lecture, Display of animation video clips	written/ viva voce	F & S	I	
CO2	Explain Tanaffuss ke marakiz (centers of respiration),	Cognitive/c omprehens ions	MK	Kh	Lecture	written/ viva voce	F & S	I	

CO2, CO4	Demonstrate Masnooi tanaffuss aur inke muqhtalif tareeqe (artificial respiration and its methods),	Psychomotor	MK	S	Demonstrate/ lecture, Display of video clips, simulation	written/ viva voce	F & S	I	
CO2	Describe Ahjame-e-reviyyah/ Jasamat-e-reviya (pulmonary volume),	Cognitive/comprehensions	MK	Kh	Lecture/ concept map	written/ viva voce	F & S	I	
CO2	Explain Waqaat-e-reviya (pulmonary capacities)	Cognitive/comprehensions	MK	Kh	Lecture	written/ viva voce	F & S	I	
CO2, CO4, CO5	Describe Usre tanaffuss (dyspnoea), definition, causes, types, clinical presentation	Cognitive/comprehensions	MK	Kh	Lecture, Simulation	written/ viva voce	F & S	I	
CO2, CO4, CO5	Describe Qillat-e-baad (anoxia)	Cognitive/comprehensions	MK	Kh	Lecture	written/ viva voce	F & S	I	
CO2, CO4, CO5	Describe Dushwaar-e-tanaffuss (apnoea)	Cognitive/comprehensions	MK	Kh	Lecture/Symposium	written/ viva voce	F & S	I	
CO2, CO4, CO5	Describe Izdiyad-e-tanaffuss (hypercapnia)	Cognitive/comprehensions	MK	Kh	Lecture/small group teachings	written/ viva voce	F & S	I	
CO2, CO4, CO5	Explain Sathe-murtafa aur gehre paani ke feliyati	Cognitive/comprehens	MK	Kh	Lecture/ Tutorial	written/ viva voce/project work	F & S	I	

	asraat (physiological effect of high altitude & under water).	ions							
Topic 3- Nizam-e-Ikhraj (Excretory system) (Lecture:- **14** hours, Non lecture **11**hours)									
CO2	Describe the structure and function of kulliya (kidney)	Cognitive/comprehensions	MK	KH	Lecture	Written/Viva	F&S	II	
CO2, CO3	Explain the non-excretory functions of kidney	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
C02	Describe the structure and function of (kulvi ikai) nephron	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO2, CO3	Describe the kulliyavi doran-e-khoon (renal circulation)	Cognitive/comprehensions	DK	KH	Lecture	Written/viva	F&S	II	
CO2, CO6, CO7	Enumerate the steps to measure renal blood flow.	Cognitive/Recall	NK	K	Small group teaching	Written/viva	F&S	II	
CO2	Describe the structure and function of aljihazul mujawiru lilkubaiba (Juxta glomerulus apparatus)	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	

CO2, CO3	Explain the renin-angiotensin system	Cognitive/comprehensions	MK	KH	Lecture/small group teaching	Written/viva	F&S	II	
CO2, CO4	Describe the mechanism of paidish-e- bowl (urine formation involving processes of Filtration, tubular reabsorption and secretion.	Cognitive/comprehensions	MK	KH	Lecture/symposium	Written/viva	F&S	II	
CO2	Explain the counter- current mechanism of urine concentration.	Cognitive/comprehensions	MK	Kh	Small group teaching	Written/viva	F&S	II	
CO4, CO6	Define & describe shrah at tarsheehul kubabibi (glomerular filtration rate) & factors affecting GFR	Cognitive/comprehensions	DK	Kh	Lecture	Written/viva	F&S	II	
CO2	EXPLAIN the tubular reabsorption process and process of tubular secretion.	Cognitive/comprehensions	MK	Kh	Lecture/video clips	Written/viva	F&S	II	
CO2, CO3	Explain renal clearance mechanisms	Cognitive/comprehensions	NK	Kh	Small group discussion/PBL	Written/viva	F&S	II	

CO2, CO6	Describe the methods to measure GFR, and other clearance tests	Cognitive/comprehensions	MK	Kh	Small group teaching	Written/viva	F&S	II	
CO1, CO4	Describe renal Regulation of fluid and electrolytes	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO1, CO2, CO3	Describe the role of kidney in maintaining body temperature	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO2, CO3	Explain physiology of micturition and its abnormalities	Cognitive/comprehensions	MK	Kh	Small group teaching	Written/viva	F&S	II	
CO4, CO6	Bowl ka radde-amal aur wazn-e-makhsoos (reaction and specific gravity of urine),	Cognitive/comprehensions	MK	Kh	Lecture/ small group teachings	Written/ viva voce	F & S	II	
CO6, CO7	Describe cystometry and urogram	Cognitive/comprehensions	NK	Kh	Small group discussion/PBL	Written/viva	F&S	II	
CO4	Describe urinary bladder dysfunctions	Cognitive/comprehensions	NK	Kh	Small group discussion/PBL	Written/viva	F&S	II	
CO4	Explain the mechanism of action of diuretics	Cognitive/comprehensions	NK	Kh	Lecture	Written/viva	F&S	II	
CO4	Describe artificial kidney, and renal	Cognitive/comprehens	NK	Kh	Self-directed learning	Written/viva	F&S	II	

	transplantation.	ions							
CO4	List the indications and need of renal transplantation	Cognitive/Recall	NK	K	Symposium	Written/viva	F&S	II	
CO4	List the indications of dialysis.	Cognitive/Recall	DK	K	Symposium	Written/viva	F&S	II	
CO4	Describe and discuss advantages & complications of renal transplantation..	Cognitive/comprehensions	NK	Kh	Self-study	Written/viva	F&S	II	
CO6, CO7	Enumerate & describe the renal function tests	Cognitive/Recall	MK	K	Lecture/ concept map	Written/viva	F&S	II	
CO6, CO7	Interpret & analyze RFT	Cognitive/Analysis	DK	Kh	Lecture/PBL	Written/viva	F&S	II	
CO2, CO3	Describe unani concept of istifragh-e-tabayi	Cognitive/comprehensions	MK	KH	Tutorials/small group discussion	Written/viva	F	II	
CO2, CO3	Describe unani concept of idrar-e-bowl.	Cognitive/comprehensions	MK	KH	Tutorials/small group discussion	Written/viva	F	II	
CO2, CO3	Describe unani concept of ihtibas-e-bowl	Cognitive/comprehensions	MK	KH	Tutorials/small group discussion	Written/viva	F	II	
Topic 4- Nizam-ie-Jild (Integumentary system) (Lecture:- **04** hours, Non lecture **02** hours)									
CO2	Describe Jild ki saqht aur afaal (structure and	Cognitive/comprehensions	MK	Kh	Lecture, display of histological slides	Written/ viva voce	F & S	II	

	functions of skin) [integument],								
CO2, CO4,	Explain Arq (sweat)	Cognitive/comprehensions	MK	Kh	Lecture	Written/ viva voce	F & S	II	
CO2, CO3 CO4	Describe Hararat-e-badaniya ke tavazun mein jild ka kirdar (role of skin in regulation of body temperature)	Cognitive/comprehensions	MK	Kh	Lecture/ symposium	Written/ viva voce	F & S	II	
CO2, CO3, CO4, CO5	Describe Ghair tabiyyee hararat aur qillate-hararat (abnormal and sub-normal temperature).	Cognitive/comprehensions	MK	Kh	Lecture/ PBL	Written/ viva voce	F & S	II	
Topic 5- *Nizam-e-Asab* (Nervous system) (Lecture:- **19** hours, Non lecture **11** hours)									
CO2, CO3	Describe the functional anatomy and physiological properties of the nerves	Cognitive/comprehensions	MK	Kh	Lecture/self-directed learning	Written/viva	S	II	
CO2, CO3	Describe organization of the nervous	Cognitive/comprehensions	MK	Kh	Lecture / concept map	Written/viva	S	II	

	system into central NS, peripheral NS, somatic NS & autonomic NS.								
CO2, CO3	Describe and define action potentials in nervous system	Cognitive/comprehensions	MK	KH	Lecture/ video clip	Written/viva	F &S	II	
CO2, CO 3, CO 4	List the factors affecting conduction velocity in a nerve.	Cognitive/Recall	NK	K	Lecture	Written/viva	S	II	
CO2, CO 3	Outline the cell types present in the nervous system	Cognitive/comprehensions	MK	Kh	Lecture /Project work	Written/viva	F&S	II	
CO2, CO 3	Describe structural and functional morphology of neurons	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	II	
CO2, CO 3	Describe the different types	Cognitive/comprehensions	MK	Kh	Project work	Written/viva	F&S	II	

	of neurons and neuroglia								
CO2, CO 3	Differentiate between myelinated and non-myelinated neurons and between white matter and grey matter.	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	II	
CO2, CO 3	Define and describe the terms 'nuclei' and 'ganglia'	Cognitive/Recall	MK	K	Lecture	Written/viva	S	II	
CO2, CO 3	Define the term nerve fibres and state the types of fibres	Cognitive/Recall	MK	K	LECTURE / tutorial	Written/viva	F&S	II	
CO2, CO 3	Outline the types of fibres in a mixed peripheral nerve.	Cognitive/Recall	MK	K	LECTURE/concept map	Written/viva	F&S	II	
CO2, CO 3	Define the term mashbak/ittisal (synapse)	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	

CO2, CO 3	Differentiate between electrical & chemical synapse	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO4	Describe chemical synapse transmission	Cognitive/comprehensions	MK	KH	LECTURE/ video clip	Written/viva	S	II	
CO2, CO 3	Define the term asabi mursalat (neurotransmitters)	Cognitive/Recall	MK	K	Lecture	Written/viva	F	II	
CO2, CO 3	Outline and classify the various neurotransmitters	Cognitive/comprehensions	DK	Kh	Self-directed learning	Written/viva	F	II	
CO2, CO 3,	Describe functioning of neurotransmitters	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	II	
CO2, CO 3	Describe organization and functional anatomy of CNS	Cognitive/comprehensions	MK	Kh	LECTURE/ concept map	Written/viva	F&S	II	
CO2, CO 3	Describe	Cognitive/comprehens	MK	Kh	Lecture	Written/viva	F&S	II	

	functions of CNS	ions							
CO2, CO 3	Explain integrative functions of CNS and levels of CNS	Cognitive/comprehensions	MK	Kh	LECTURE/Role play	Written/viva	F&S		
CO2, CO 3	Define & classify sensations	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3	Describe sensory modalities	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3	List the sensory receptor for each modality of sensation	Cognitive/Recall	MK	K	Lecture/Project work	Written/viva	F&S	II	
CO2, CO 3	Describe pain and temperature receptors	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3	Describe touch receptors	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3	Describe receptors for proprioception	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3	Describe sensory pathways for Transmitting somatic signals.	Cognitive/comprehensions	MK	Kh	Lecture/concept map	Written/viva	F&S	II	

CO2, CO 3,	Describe ascending and descending tracts	Cognitive/Recall	MK	K	Lecture/concept map	Written/viva	F&S	II	
CO2, CO 3,	Describe the organizations of the motor system.	Cognitive/Recall	MK	KH	Lecture/tutorials	Written/viva	F&S	II	
CO2, CO 3, CO 4	Define & describe UMN & LMN LEISIONS	Cognitive	MK	KH	Lecture/PBL	Written/viva	F&S	II	
CO2, CO 3, CO 4	Define and classify the term 'reflex'	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 4	Illustrate the components of a reflex arc diagrammatically	Cognitive/Recall	MK	KH	Lecture/concept map	Written/viva	F&S	II	
CO2, CO 3, CO 4	Describe in detail, the physiological significance of reflexes	Cognitive/comprehensions	DK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3,	Describe organization and	Cognitive/comprehensions	NK	K	Lecture	Written/viva	F&S	II	

	the functional anatomy of cerebellum								
CO2, CO 3,	Describe functions of cerebellum	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3,	Define the term basal ganglia.	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3,	Outline the forming elements of the basal ganglia	Cognitive/comprehensions	MK	Kh	Lecture/Project work	Written/viva	F&S	II	
CO2, CO 3, CO 4	Explain the physiological role and significance of basal ganglia.	Cognitive/comprehensions	MK	KH	LECTURE/symposium	Written/viva	F&S	II	
CO2, CO 3,	Define the autonomic nervous system	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3,	Describe classification of the autonomic nervous system	Cognitive/comprehensions	MK	Kh	LECTURE/concept map	Written/viva	F&S	II	

CO2, CO 3,	Outline the functions of the autonomic nervous system	Cognitive/comprehensions	MK	Kh	Lecture/Project work	Written/viva	F&S	II	
CO2, CO 3,	Differentiate between sympathetic and para sympathetic nervous system	Cognitive/comprehensions	MK	Kh	LECTURE/Role play	Written/viva	F&S	II	
CO2, CO 3,	Describe physiological anatomy of spinal cord	Cognitive/comprehensions	MK	Kh	Self-directed learning/ lecture	Written/viva	F&S	II	
CO2, CO 3,	Describe spinal nerves and nerve roots	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	II	
CO2, CO 3,	Describe arrangements of white and grey matter in spinal cord	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 4	Describe CSF, and its composition	Cognitive/comprehensions	MK	Kh	Lecture/Project work	Written/viva	F&S	II	

CO2, CO 3, CO 4	Describe characteristics and functions of CSF	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 4, CO 5	Outline the factors controlling the formation and circulation of CSF	Cognitive/Recall	DK	K	Lecture/small group teachings	Written/viva	F&S	II	
CO2, CO 3	Define and classify sleep	Cognitive/Recall	DK	K	Self-study	Written/viva	F&S	II	
CO2, CO 3	Describe physiological changes during sleep	Cognitive/comprehensions	NK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3	Explain stages of sleep	Cognitive/comprehensions	DK	KH	LECTURE/Small group teaching	Written/viva	F&S	II	
CO2, CO 3	Define and classify pain	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 4, CO 5	Describe pathways and mechanism of pain	Cognitive/comprehensions	MK	KH	LECTURE/concept map	Written/viva	F&S	II	
CO2,	Describe	Cognitive/c	MK	KH	Self directed	Written/viva	F&S	II	

CO 3, CO 4	quwwat-e-nafsanniyah	omprehensions			learning				
CO2, CO 3, CO 4	Describe hawas-e-khamsa zahira wa batina	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO9	Describe & demonstrate EEG	Psychomotor	MK	S	Lecture/demontration	Written/viva	F&S	II	
CO9	Outline the main clinical uses of EEG	Cognitive/Recall	NK	K	Lecture/ Project work	Written/viva	F&S	II	
CO2, CO 3, CO 6, CO 9	Elicit various superficial and deep reflexes and indicate their significance.	Psychomotor	MK	S	LECTURE/demonstration	Written/viva	F&S	II	
CO2, CO 3	Describe the structure and functions of taste buds	Cognitive/comprehensions	DK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3	Outline location of taste buds and mechanism of	Cognitive/comprehensions	MK	KH	Lecture/small group discussion	Written/viva	F&S	II	

	stimulation of taste bud								
CO2, CO 3	Describe pathways for taste transmission	Cognitive/comprehensions	MK	KH	LECTURE/concept map	Written/viva	F&S	II	
CO2, CO 3	Define primary taste sensations and describe taste transduction	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 4	Outline the taste receptors	Cognitive/Recall	MK	K	Lecture/ Project work	Written/viva	F&S	II	
CO2, CO 3, CO 4	Describe olfactory receptors and mechanism of excitation of the olfactory cells	Cognitive/comprehensions	MK	KH	Lecture/tutorials	Written/viva	F&S	II	
CO2, CO 3,	Describe olfactory pathways and transmission.	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3,	Explain olfactory transduction	Cognitive/comprehens	MK	KH	Lecture	Written/viva	F&S	II	

		ions							
CO2, CO 3,	Describe rapid adaptation of olfactory sensations	Cognitive/comprehensions	MK	KH	LECTURE/ small group teaching	Written/viva	F&S	II	
CO2, CO 3, CO 4	Explain threshold for olfactory sensations	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 5	Outline the pathophysiology of altered taste and smell	Cognitive/Recall	NK	K	Lecture/Project work	Written/viva	F&S	II	
CO2, CO 3	Describe and discuss functional anatomy of ear	Cognitive/comprehensions	MK	Kh	LECTURE/ video clip	Written/viva	F&S	II	
CO2, CO 3	Describe tympanic membrane and the Ossicular system	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	II	
CO2, CO 3	Explain conduction of sound from the	Cognitive/comprehensions	MK	Kh	LECTURE/ video clip	Written/viva	F&S	II	

	Tympanic membrane to the cochlea								
CO2, CO 3	Describe transmission of sound through Bone	Cognitive/comprehensions	MK	KH	LECTURE/ video clip	Written/viva	F&S	II	
CO2, CO 3	Describe functional anatomy of the Cochlea	Cognitive	MK	Kh	LECTURE/ video clip	Written/viva	F&S	II	
CO2, CO 3	Explain transmission of sound waves in The cochlea	Cognitive/comprehensions	MK	KH	LECTURE/symposium	Written/viva	F&S	II	
CO2, CO 3	Describe function of the organ of corti	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 4	Describe determination of sound Frequency	Cognitive/comprehensions	DK	KH	Lecture	Written/viva	F&S	II	
CO2	Describe brief physics of sound and concept of	Cognitive/comprehensions	NK	KH	Self-directed learning/ lecture	Written/viva	F&S	II	

	the decibel scale								
CO2, CO 7	Describe threshold for hearing sound, and list it for different Frequencies	Cognitive/comprehensions	NK	KH	Self-directed learning/ lecture	Written/viva	F&S	II	
CO2, CO 3	Describe auditory nervous pathways and their mode of functioning	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3	Explain functions of the cerebral cortex in Hearing	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3	Explain determination of the direction From which sound comes and neural mechanisms for detecting sound direction	Cognitive/comprehensions	MK	KH	LECTURE/Role play	Written/viva	F&S	II	

CO2, CO 3, CO 4, CO 5	Outline pathophysiology of deafness	Cognitive/Recall	MK	KH	Lecture/Project work	Written/viva	F&S	II	
CO2, CO 7	Outline & describe various tests of hearing	Cognitive/Recall	MK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3	Describe the physiological anatomy of the eye and its accessory Structures	Cognitive/Recall	MK	K	LECTURE/video clip	Written/viva	F&S	II	
CO2, CO 3	Describe anatomy and function of the retina	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	II	
CO2, CO 3	Explain the formation of image on the retina	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 4	Explain mechanism of “accommodation “and its significance in	Cognitive/comprehensions	MK	Kh	LECTURE/video clip	Written/viva	F&S	II	

	eye optics								
CO2, CO 3, CO 9, CO 10	Describe visual acuity	Cognitive/comprehensions	MK	Kh	LECTURE / demonstration	Written/viva	F&S	II	
CO2, CO 3, CO 4	Describe and classify Intraocular fluids	Cognitive	MK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 4	Explain formation and outflow of aqueous humour	Cognitive/comprehensions	DK	KH	LECTURE/video clip	Written/viva	F&S	II	
CO2, CO 3, CO 6	Define intraocular pressure and describe its physiological and clinical significance	Cognitive/Recall	MK	K	LECTURE/Small group teaching	Written/viva	F&S	II	
CO2, CO 3	Describe photoreceptors and photochemistry of vision	Cognitive/comprehensions	MK	KH	LECTURE/Small group teaching	Written/viva	F&S	II	
CO2, CO 3	Define rhodopsin-	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	II	

	retinal Visual cycle and mechanism of Excitation of the rods								
CO2, CO 3	Describe colour vision and role of Cones	Cognitive/comprehensions	MK	KH	Lecture/pbl	Written/viva	F&S	II	
CO2, CO 3	Explain mechanics of colour detection	Cognitive/comprehensions	DK	KH	Student teaching	Written/viva	F&S	II	
CO2, CO 3	Describe light and dark Adaptation	Cognitive/comprehensions	DK	KH	Lecture	Written/viva	F&S	II	
CO2, CO 3	Describe visual pathways	Cognitive/comprehensions	MK	K	LECTURE/concept map	Written/viva	F&S	II	
CO2, CO 3	Describe organization and function of the Visual cortex	Cognitive/comprehensions	NK	K	Lecture	Written/viva	F&S	II	
CO2, CO 3, CO 4	Describe eye movements and their muscular and neural control	Cognitive/comprehensions	DK	KH	LECTURE/video clip	Written/viva	F&S	II	

CO2, CO3, CO4	Explain fusion of the visual images from The two eyes	Cognitive/comprehensions	DK	KH	Self-study	Written/viva	F&S	II	
CO4, CO5	Define hyperopia, myopia, astigmatism, presbyopia, and strabismus	Cognitive/Recall	MK	K	Lecture/PBL	Written/viva	F&S	II	
CO2, CO4, CO5	Describe and discuss the physiological basis of lesion in visual pathway	Cognitive/Recall	MK	K	Lecture/PBL	Written/viva	F&S	II	
CO4, CO5	DESCRIBE in detail the errors of refraction and outline the ways to correct refractive errors of eye	Cognitive/Application	MK	KH	Lecture/Project Work	Written/viva	F&S	II	
CO9	Demonstrate steps to test	Cognitive/ Psychomot	MK	S	Demonstration	Written/viva	F&S	II	

	distant and near vision	or							
CO9	Outline the tests of colour vision	Cognitive/Recall	MK	K	Lecture/demonstration	Written/viva	F&S	II	
Topic 6- *Nizam-e-Ghudood-e-la Qanatiyah* (Endocrine system) (Lecture:- **19** hours, Non lecture **10**hours)									
CO2	Describe ghudood-e-la qanatiyah endocrine glands)	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	III	
CO2	Define rasilat (hormones)& Classify the hormones based on their chemical nature	Cognitive/Recall	MK	K	Self-directed learning	Written/viva	F&S	III	
CO2	Discuss & describe synthesis of hormones	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO3, CO 4	Describe the general properties of rasilat.	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO7	Describe radioimmunoassay	Cognitive/comprehensions	NK	KH	Lecture/video clip	Viva	F&S	III	
CO3, CO 4	Explain the mechanism of action of hormones.	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	

CO3, CO 4	Describe cAMP second messenger system.	Cognitive/comprehensions	MK	KH	Lecture / concept map	Written/viva	F&S	III	
CO2	Describe the calcium metabolism and physiology of bone	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2	Discuss the hormones for calcium metabolism, their secretion and regulation	Cognitive/comprehensions	MK	KH	Lecture /seminar	Written/viva	F&S	III	
CO2, CO 3	Describe the jar-i-darqin (parathormone) and its functioning In calcium metabolism	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
C02, CO 3	Discuss the physiological anatomy of taht-us-sarir (hypothalamus)	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2	Enumerate the hormones released from Hypothalamus & discuss their roles	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	III	
CO2, CO 3	Describe the functional anatomy	Cognitive/comprehens	MK	Kh	Lecture	Written/viva	F&S	III	

	of ghudda nukhamiyah (pituitary),	ions							
CO2, CO3	List the hormones secreted from ghudda nukhamiyah muqaddam (anterior pituitary) & discuss their functions.	Cognitive/Recall	MK	K/KH	Small group discussion/lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the synthesis & REGULATION of the rasila-i-namu (growth hormone)	Cognitive/comprehensions	MK	KH	Small group teaching	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the physiological Functions of the growth hormone	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	S	III	
CO2, CO 3, CO 4	Describe abnormalities of Growth hormone secretions	Cognitive/comprehensions	MK	KH	Lecture/video clip	Written/viva	S	III	
CO2, CO 3	Describe the physiological anatomy of posterior Pituitary.	Cognitive/comprehensions	MK	Kh	Self-directed learning	Written/viva	F	III	
CO2, CO 3	List the hormones released from posterior pituitary.	Cognitive/Recall	MK	K	Lecture	Written/viva	F& S	III	
CO2, CO 3,	Outline the synthesis,	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	III	

CO 4	Regulation and actions of ADH								
CO4	Discuss the disorders of ADH secretion	Cognitive/comprehensions	DK	KH	Lecture/ symposium	Written/viva	S	III	
CO4	Explain syndrome of inappropriate hyper-secretion of anti-diuretic hormone (SIADH)	Cognitive/comprehensions	DK	KH	Lecture	Written/viva	S	III	
CO2, CO 3, CO 4	Outline the synthesis, Regulation and actions of Oxytocin	Cognitive/Recall	MK	K	Small group teaching	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe functional anatomy of ghudda-e darqiyyah	Cognitive/comprehensions	MK	Kh	Self-directed learning	Written/viva	F	III	
CO2, CO 3, CO 4	Describe the synthesis and secretion of the darqin (Thyroid) metabolic hormones	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe physiological effects of darqin (thyroid hormone)	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Enumerate the signs and symptoms of hyper	Cognitive/Recall	MK	K	Lecture/PBL	Written/viva	F	III	

	& hypo secretions of thyroid hormones								
CO2, CO 3, CO 4	Describe goitre and discuss its patho-physiology	Cognitive/comprehensions	MK	Kh	Lecture/video clip	Written/viva	F	III	
CO2,	Describe the physiological anatomy of ghudda-e-kazriyyah (adrenal cortex and medulla)	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F	III	
CO2, CO 3	Enumerate the hormones released from adrenal cortex	Cognitive/Recall	MK	K	Lecture	Written/viva	F	III	
CO2, CO 3	Describe the functions of the hormones released from adrenal cortex	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F& S	III	
CO2, CO 3, CO 4	Explain in detail the regulation of hormones released from adrenal cortex	Cognitive/comprehensions	DK	Kh	Lecture /Concept Map	Written/viva	S	III	
CO4, CO 5	Explain the disorders of adrenal cortex hormones.	Cognitive/comprehensions	MK	Kh	Lecture/PBL	Written/viva	S	III	
CO2, CO 3, CO 4	Describe the Physiological anatomy of banqiras	Cognitive/comprehensions	MK	Kh	Lecture	Written/viva	F	III	

	(pancreas).								
CO2, CO 3, CO 4	Outline the endocrine hormones secreted from pancreas	Cognitive/Recall	MK	K	Lecture	Written/viva	F &S	III	
CO2, CO 3, CO 4	Describe the synthesis, regulation and functions of insulin and glucagon	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F &S	III	
CO2, CO 3, CO 4	Discuss the pathophysiology, signs and symptoms of diabetes Mellitus	Cognitive/comprehensions	MK	Kh	Lecture/PBL	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe glucose tolerance test and interpretation of the results	Cognitive/comprehensions	MK	Kh	Lecture/Tutorials	Written/viva	S	III	
CO2, CO 3	Describe the physiological anatomy of Ghudda sa'atariyah (thymus) and ghhudda-e - sanobariyah (pineal	Cognitive/comprehensions	DK	Kh	Symposium	Written/viva	S	III	

	gland)								
CO2, CO 3	Describe secretions of thymus and pineal gland and their functions	Cognitive/comprehensions	NK	Kh	Tutorials	Written/viva	S	III	
CO2, CO 4	Discuss the physiology of Circadian rhythm	Cognitive/comprehensions	NK	KH	Lecture/small group discussion	Written/viva	S	III	
Topic 7- *Nizam-e-Tauleed* (Reproductive system) (Lecture:- **14**hours, Non lecture **10**hours)									
CO2, CO 3, CO 4	Describe sex differentiation & determination	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	S	III	
CO2, CO 3, CO 4	Discuss the role of gametes & chromosomes in sex differentiation	Cognitive/comprehensions	MK	KH	Small group discussion	Written/viva	S	III	
CO2, CO 3, CO 4	Describe gonadal differentiation, and psychological differentiation	Cognitive/comprehensions	NK	KH	Small group discussion	Written/viva	S	III	
CO2 ,CO 4, CO 5	Outline chromosomal abnormalities, hormonal abnormalities	Cognitive/Recall	NK	KH	Symposium	Written/viva	S	III	

	and their features (sex-linked)								
CO2, CO 3, CO 4	Describe and discuss bulooghat (puberty): onset, progression and stages.	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Summarize physical & hormonal changes during puberty	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO5	Outline disorders of puberty	Cognitive/Recall	DK	K	Small group discussion	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the physiological anatomy of nizam-e-tauleed mardana (male reproductive system)	Cognitive/comprehensions	DK	Kh	Lecture	Written/viva	F&S	III	
CO2, CO 3	Describe and Outline the steps	Cognitive/Recall	MK	KH	Lecture/Concept Map	Written/viva	F&S	III	

	involved in spermatogenesis								
CO2, CO 3, CO 4	Describe the structure of rasilat-i-khusya (testosterone), and describe its synthesis, metabolism, transport and actions.	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the regulation of testosterone secretion	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO5	List & discuss the abnormal conditions like Cryptorchidism , Hypo & hypergonadism	Cognitive/Recall	NK	K	Small group discussion	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the physiological anatomy of ghudda-e-madhi	Cognitive/comprehensions	MK	KH	Self-directed learning	Written/viva	F&S	III	

	(prostate) and seminal vesicles.								
CO2, CO 3, CO 4	Describe the role of prostate and seminal vesicles in reproduction.	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4, CO 6	Describe the composition of semen	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the cause, mechanism of erection and ejaculation	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe physiological anatomy of nizam-e-tawleed zanana (female reproductive system)	Cognitive/comprehensions	MK	KH	Lecture/video clip	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the menstrual cycle.	Cognitive/comprehensions	MK	KH	Small group teachings	Written/viva	F&S	III	
CO2,	Describe the	Cognitive/c	MK	KH	Lecture/ small	Written/viva	F&S	III	

CO 3, CO 4	changes that occur during the menstrual cycle.	omprehens ions			group teachings				
CO2, CO 3, CO 4	Describe physiological anatomy and functions of ovaries	Cognitive/c omprehens ions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the regulation of ovarian functions	Cognitive/c omprehens ions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Discuss the general structures and functions of rasila muwallid-i-bayda (oestrogen) and rasila mu'in al-haml (progesterone)	Cognitive/c omprehens ions	MK	KH	Lecture/small group discussion	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe ibadha (ovulation).	Cognitive/c omprehens ions	MK	KH	Lecture/video clip	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the baar-aawari (fertilization),	Cognitive/c omprehens ions	MK	KH	Lecture video clip	Written/viva	F&S	III	

	isteqrar-e-hamal (implantation) and placenta formation								
CO2, CO 3, CO 4	Describe the placenta and its functions	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Enumerate the hormones secreted from placenta and their functions	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe the physical and hormonal changes that accompany pregnancy	Cognitive/comprehensions	MK	KH	Lecture/concept map	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe mechanism and Control of wiladat (parturition)	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe physiologyof ilban/ amal-e-	Cognitive/comprehensions	MK	Kh	Symposium	Written/viva	F&S	III	

	raza'at (lactation)								
CO2, CO 3, CO 4	Describe functional anatomy of mammary gland	Cognitive/comprehensions	MK	Kh	Small group discussions	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe breast development and milk production.	Cognitive/comprehensions	MK	Kh	Small group Discussion	Written/viva	F&S	III	
CO2, CO 3, CO 4	Define Iyas (menopause)	Cognitive/Recall	MK	K	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Explain the hormonal Changes and their effects during perimenopause and menopause	Cognitive/comprehensions	MK	KH	Lecture	Written/viva	F&S	III	
CO2, CO 3, CO 4	Enumerate physiological effects of perimenopause and menopause	Cognitive/Recall	MK	K	Lecture /Project Works	Written/viva	F&S	III	
CO2, CO 3, CO 4	Describe quwwate tanasulliya in	Cognitive/comprehensions	NK	KH	Lecture/small group discussion	Written/viva	S	III	

	general								
CO2, CO 3, CO 4	Unani concept of tawleed-e-mani wa tawleed-e-aaza	Cognitive/comprehensions	MK	KH	Self-directed learning	Written/viva	S	III	

Table 4: Learning objectives of Manafeul Aza UNIUG-MZ (Practical)

A4 Course outcome	B4 Learning Objective (At the end of the Practical/ Clinic the Students should be able to)	C4 Domain	D4 Must to know/desire to know/Nice to know	E4 Level Does/shows / Knows how/ Knows	F4 T-L method	G4 Assessment	H4 Formative /summative	I4 Term	J4 Integration
Practical 1- General Physiology (Non Lecture:- **76** hours)									
CO9	Describe & demonstrate Working & usage of stethoscope	Cognitive/Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	I	
CO9	DESCRIBE & demonstrate the use of Light Microscope	Cognitive/ Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	I	
CO9	Demonstrate& explain various tissue slides by microscope	Cognitive/Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	I	
CO9	Measure Body temperature by thermometer.	Psychomotor	MK	S	Demonstration/ practical/ hands on training	Written/viva	F&S	I	
Practical 2- Respiratory System (Non Lecture:- **20** hours)									

CO9	Describe, record & analyze respiratory sounds	Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	I	
CO9	Describe, Measure, record & analyze the lung volume capacities	Cognitive/Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	I	
Practical 3- Digestive System (Non Lecture:- **12** hours)									
CO9	Record and analyse Bowel sounds	Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	I	
CO9	Measure BMI	Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	I	
Practical 4- Haematology (Non Lecture:- **70** hours)									
CO9	Demonstrate Collection of blood samples	Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	II	
CO9	Collect blood serum and plasma	Psychomotor	MK	S	Demonstration/ practical/ hands on training	Written/viva	F&S	II	

CO9	Prepare blood film	Psychomotor	MK	S	Demonstration/ practical/ hands on training	Written/viva	F&S	II	
CO9	Identify various blood cells under microscope	Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	II	
CO9	Determine Differential Leucocyte Count	Psychomotor	MK	S	Demonstration/ practical/ hands on training	Written/viva / Practical Performance	F&S	II	
CO9	Estimate Haemoglobin	Psychomotor	MK	S	Demonstration/ practical/ hands on training	Written/viva / Practical Performance	F&S	II	
CO9	Determine Blood Groups	Psychomotor	MK	S	Demonstration/ practical	Written/viva / Practical Performance	F&S	II	
CO9	Determine Bleeding and Clotting time	Psychomotor	MK	S	Demonstration/ practical/ hands on training	Written/viva / Practical Performance	F&S	II	
CO9	Demonstrate Haemocytometry (Diluting pipettes and Neubauer's chamber	Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	II	
CO9	Determine total	Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	II	

	RBC Count								
CO9	Determine total WBC Count	Psychomotor	MK	S	Demonstration/ practical	Written/viva / Practical Performance	F&S	II	
CO9	Demonstrate Packed Cell Volume and Erythrocyte Sedimentation Rate	Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	II	
CO9	Demonstrate the Blood Indices	Psychomotor	DK	S	Demonstration/ practical	Written/viva	F&S	II	
Practical 5- Urology (Non Lecture:- **36** hours)									
CO9	Perform physical and microscopic examination of urine	Psychomotor	MK	S	Demonstration/ hands on training	Written/viva / Practical Performance	F&S	II	
CO9	Perform Qualitative analysis of sugar in urine (benedict's method)	Psychomotor	MK	S	Demonstration/ hands on training	Written/viva / Practical Performance	F&S	II	
CO9	Perform	Psychomot	MK	S	Demonstration/	Written/viva	F&S	II	

	Qualitative analysis of protein in urine	or			practical				
CO9	Estimate Albumin in urine	Psychomotor	MK	S	Demonstration/ practical/	Written/viva / Practical Performance	F&S	II	
Practical 6- Cardio vascular system (Non Lecture:- **32** hours)									
CO9	Perform palpation of radial pulse	Psychomotor	MK	S	hands on training	Written/viva	F&S	III	
CO9	Describe, Measure & record arterial Blood Pressure in different physiological conditions.	Cognitive/Psychomotor	MK	S	Demonstration/ hands on training	Written/viva	F&S	III	
CO9	Describe, discuss & record Normal Electrocardiogram and interpret rhythm, heart rate and cardiac axis.	Cognitive/	MK	S	Demonstration/ practical/Early Clinical Exposure	Written/viva	F&S	III	

CO9	Describe, record & analyze the Heart sounds	Cognitive/Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	III	
Practical 7- Nervous system (Non Lecture:- **20** hours)									
CO9	Demonstrate use of E.E.G machine	Cognitive/Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	II	
CO9	Perform nerve conduction test	Psychomotor	DK	S	Demonstration/ hands on training	Written/viva	F&S	II	
Practical 8- Special senses (Non Lecture:- **14** hours)									
CO9	Measure visual field by perimetry	Psychomotor	MK	S	Demonstration/ practical	Written/viva	F&S	III	
CO9	Measure visual acuity	Psychomotor	DK	S	Demonstration/ practicals/Early Clinical Exposure	Written/viva	F&S	III	
CO9	Test color vision by ishihara chart	Psychomotor	MK	S	Demonstration/ practicals/	Written/viva	F&S	III	
CO9	Test bone and air conduction using tuning forks	Psychomotor	MK	S	Demonstration/ practicals	Written/viva	F&S	III	

Table 5- Non Lecture Activities of Manafeul Aza UNIUG-MZ

	Sr No	List non lecture Teaching-Learning methods	No of Activities
A		Activities in classroom	
	1	symposium	20
	2	Seminar	02
	3	Early Clinical Exposure	02
	4	Project Work	03
	5	Problem Based Learning	09
	6	Discussion / small Group discussion	29
	7	Tutorials	09
	8	Small group teachings	08
	9	Educational videos	10
	10	Animation clips	04
	11	Role play	02
	12	Concept maps	08
	13	Demonstration	04
	14	Self-directed learnings	08
	15	Activity Learning	01
	16	Simulations	01
		Subtotal - **120**	
B		Activities in practical	280
	Total		**400**

Table 6: Assessment Summary

6 A - Number of papers and Marks Distribution

S.No.	Subject	Papers	Theory	Practical or Clinical Assessment					Grand Total
				Practical or Clinical	Viva	Electives	IA	Total	
1	Manafeul Aza (Human Physiology) Paper – I Paper - II	2	200	100	20	10	20	150	350

6. B - Scheme of Assessment (formative and Summative)

SR.NO.	PROFESSIONAL COURSE	DURATION OF PROFESSIONAL COURSE		
		First Term (1-6 Months)	Second Term (7-12 Months)	Third Term (13-18 Months)
1	First	3 PA & First TT	3 PA & Second TT	3 PA & UE

PA: Periodical Assessment; TT: Term Test; UE: University Examinations

6 C - Calculation Method for internal assessment Marks (20 Marks)

TERM	PERIODICAL ASSESSMENT				TERM TEST	TERM ASSESSMENT	
	A	B	C	D	E	F	G
	1 (20)	2 (20)	3 (20)	Average (A+B+C/3) 20	Term Test (MCQ+SAQ+LAQ And Practical (Converted to 20)	Sub Total	Term Assessment
FIRST						D+E	D+E /2
SECOND						D+E	D+E /2
THIRD					NIL	D	D
Final IA	Average of Three Term Assessment Marks as Shown in 'G' Column						

6 D - Evaluation Methods for Periodical Assessment

S. No.	Evaluation Methods
1.	Practical / Clinical Performance
2.	Viva Voce, MCQs, MEQ (Modified Essay Questions/Structured Questions)
3.	Open Book Test (Problem Based)
4.	Summary Writing (Research Papers/ Samhitas)
5.	Class Presentations; Work Book Maintenance
6.	Problem Based Assignment
7.	Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OPSE), Mini Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedures (DOP), Case Based Discussion (CBD)
8.	Extra-curricular Activities, (Social Work, Public Awareness, Surveillance Activities, Sports or Other Activities which may be decided by the department).
9.	Small Project
10.	Other activities explained in Table 3 Column G3 as per indicated term.

6 E - Question Paper Pattern

I PROFESSIONAL BUMS EXAMINATIONS

UNIUG-MZ

PAPER-I

Time: 3 Hours Maximum Marks: 100
INSTRUCTIONS: All questions compulsory

		Number of Questions	Marks per question	Total Marks
Q 1	Multiple Choice Questions (MCQ)	20	1	20
Q 2	Short answer questions (SAQ)	8	5	40
Q 3	Long answer questions (LAQ)	4	10	40
				100

PAPER-II

Time: 3 Hours Maximum Marks: 100
INSTRUCTIONS: All questions compulsory

		Number of Questions	Marks per question	Total Marks
Q 1	Multiple Choice Questions (MCQ)	20	1	20
Q 2	Short answer questions (SAQ)	8	5	40
Q 3	Long answer questions (LAQ)	4	10	40
				100

6 F(1) - Distribution of Theory examination Paper-I

	A List of Topics	B Term	C Marks	D Type of Questions "Yes" can be asked. "No" should not be asked.		
				MCQ (1 Mark)	SAQ (5 Marks)	LAQ (10 Marks)
1	***Umoomi Manafeul Aza*** **(General physiology)**	I	10	5	1	0
	Al-istitbab (Homeostasis)الاستتباب			Yes	Yes	No
	Transport across cell membrane انتقال بين الغشاءالخليہ			Yes	Yes	No
	Action potentialجہدالفعل			Yes	Yes	No
	Muscle physiology فعليات الاعضاء			Yes	Yes	No
	Macromoleculesجزئی کبیروی سالمات کبیرہ			Yes	Yes	No
	Protein synthesis پیدائش لحمین			Yes	Yes	No
	Acid-base balanceالتوازن الحمضي القلوي			Yes	Yes	No
	Water balanceالتوازن الماء			Yes	Yes	No
2	**Study of *Khulia* and *Insaja* (Cytology and Histology)**	I	15	5	0	1
	Qhulia ki khurd beeni sakht-o-Afaal, (Brief discussion and introduction of cytology) خلیہ کی خورد بینی ساخت و افعال			Yes	No	Yes
	Tareef –e- insaja (definition) تعریف انسجہ			Yes	No	Yes
	Aqsaam –e- insaja (types)اقسام انسجہ			Yes	No	Yes
	Insaja ki Khurd beeni sakht ka phailao-wa-afaal, (distribution and function of tissues),انسجہ کی خورد بینی ساخت کا پھیلاؤ و افعال			Yes	No	Yes
	Nassej-e-bushra (epithelial tissue) نسیج بشریٰ			Yes	No	Yes
	Naseej-e-waasil (connective tissue), نسیج واصل			Yes	No	Yes
	Nassj-e-azlee (muscular tissue نسیج عضلی			Yes	No	Yes
	Naseeje asabi (nervous tissue). نسیج عصبی			Yes	No	Yes
3	***Khoon wa Nizam-e-Damwi*** **(Blood & Haemopoietic System)**خون و نظام دموی	II	30	10	2	1
	Khoon ki tareef (definition of blood), Ajza (constituents), Afaal (functions), Lazoojat aur hajam (viscosity and volume). خونکی تعریف،اجزاء، افعال، لزوجت اور حجم			Yes	Yes	Yes
	Maiyat-ud-dum (blood plasma): Ajza (constituents), Mavaad-e-lahmiya, aur afaal (plasma proteins and their functions) مائیت الدم اجزاء، مواد لحمیہ اور انکے افعال،				Yes	Yes

	Kurriyat-e-hamra (RBC): Saqht, ajza-e-tarkeebi (structure, composition), Paidaish (formation), Numu (development), aur Anjam (fate), Majmooyee taadaat (total count), Miqdaar ki takhmeen ke tareeqe (methods of estimation), Aur unke feliyati iqhtilaaf (& their physiological variations) : کریات حمراء ساخت،اجزائے ترکیبی، پیدائش ، نمو اور انجام ،مجموعی تعداد،مقدار کی تخمین کے طریقے اور انکے فعلیاتی اختلاف			Yes	Yes	Yes
	Hamratuddam (haemoglobin) ke Ajza-e-tarkeebee (composition), Aqsaam (varieties), Khwaas (properties),Miqhdaar ki takhmeen ke tareeqe (method of estimation), Aur afaal (and functions حمرۃالدم کے اجزائے ترکیبی،اقسام، خواص ، مقدار کی تخمین کے طریقے اور افعال.			Yes	Yes	Yes
	Kurriyat-e-baiza (WBC) ki Saqht(structure), Aqsaam(types), Paidaish(formation), Afaal (functions), Aur inke baahami tanasub (& their differential count : کریات بیضاء ساخت،اجزائے ترکیبی، پیدائش ، نمو اور انجام ،مجموعی تعداد، اور انکے باھمی تناسب ، مقدار کی تخمین کے طریقے اور انکے فعلیاتی اختلاف			Yes	Yes	Yes
	Aqrase damviya (platelets) ki Saqht (structure), Paidaish (formation) & Afaal (functions).اقراص دمویہ کی ساخت، پیدائش اور افعال			Yes	Yes	Yes
	Injimaduddam (coagulation of blood) ki Tareef (definition), Awamil e injimaduddam (coagulation factors), Waqfa-e-jiryanuddam (bleeding time), Waqfa-e-injimaduddam (clotting time) aur unki takhmeen (and their estimation) انجمادالدم کی تعریف،عوامل انجمادالدم،وقفہ جریان الدم، وقفہ انجمادالدم اور انکی تخمین			Yes	Yes	Yes
	Khoon ki girohbandi (Blood Groups) خون کی گروہ بندی			Yes	Yes	Yes
	Intiqaluddam (blood Transfusion) & Blood Banks انتقال الدم			Yes	Yes	Yes
4	***Nizam-e-Urooq-e-Lymphavia aur Shabki-o-Bashree Baatini*** **(Lymphatic & Reticulo-endothelial system)** نطام عروق لمفاویہ اورشبکی و بشری باطنی	I	5	0	1	0
	Rutubat-e-limfavia ki paidaish aur tarkeeb (formation and composition of lymph) رطوبت لمفاویہ کی پیدائش اور ترکیب			No	Yes	No
	Rutubat-e-limfavia ka dauran (lymphatic channels and lymphatic drainage)			No	Yes	No

	رطوبت لمفاویہ کا دوران					
	Ghudood-e- limfavia (lymph glands)غدود لمفاویہ			No	Yes	No
	Nizam-e-shabkiya mubtina ki tamheed aur afaal (introduction to reticulo-endothelial system, and its functions) نطام شبکیہ مبطنہ کی تمہید اور افعال			No	Yes	No
	Tihaal aur iske afaal (spleen & its functions).طحال اور اسکے افعال			No	Yes	No
5	***Nizam-e-Dauran-e-Khoon* (Circulatory system)** نظام دوران خون	III	20	0	2	1
	Tareef(introduction) تعریف			No	Yes	No
	Samamaat-e-qalb aur inke afaal (valves of heart and their actions) صمامات قلب اور انکے افعال			No	Yes	Yes
	Qalb ke makhsoos itsaali ansaja (special junctional tissues), قلب کے مخصوص اتصالی انسجہ			No	Yes	Yes
	Azla-e-qalb ki khusoosiyat (properties of cardiac muscles) عضلہ قلب کی خصوصیات			No	Yes	Yes
	Daura-e-qalbi (cardiac cycle) دورہ قلبی			No	Yes	Yes
	Aswaat-e-qalb (heart sounds) اصوات قلب			No	Yes	Yes
	Suqoot-e-qalb (heart block) سقوط قلب			No	Yes	Yes
	Aasaab-e-qalb (nerves of the heart), اعصاب قلب			No	Yes	Yes
	Mrakaz-e-qalb aur iske afaal (cardiac centre & its function) مرکز قلب اوراسکے افعال			No	Yes	Yes
	Barqi qalb nigari (electro-cardiograph برقی قلب نگاری			No	Yes	Yes
	Fisharruddum aur iske feliyati avamil (blood pressure and its physiological control) فشارالدم اوراسکے فعلیاتی عوامل			No	Yes	Yes
6	***Hayateen* (Vitamins)**حیاتین	II	10	0	2	0
	Hayateen ki tareef (definition)حیاتین کی تعریف			No	Yes	No
	Aqsaam (types) اقسام			No	Yes	No
	Miqdar khurak (daily requirement) مقدار خوراک			No	Yes	No
	Afaal (functions) افعال			No	Yes	No
7	***Istihala* (Metabolism)**استحالہ	III	10	0	0	1
	Istehala ki tareef (introduction to metabolism) استحالہ کی تعریف			No	No	Yes
	Nashasta ka istehala (metabolism of carbohydrate) نشاستہ کا استحالہ			No	No	Yes
	Shamiyat ka istehala (metabolism of lipids شحمیات کا استحالہ			No	No	Yes
	Humooz-e-shorain ka istehala (metabolism of amino acids)حموض شورین کا استحالہ			No	No	Yes
	Madaniyat aur paani ka istehala (mineral and water metabolism).معدنیات اور پانی کا استحالہ			No	No	Yes

6 F(2) - Distribution of Theory examination Paper-II

	A List of Topics	B Term	C Marks	D Type of Questions "Yes" can be asked. "No" should not be asked.		
				MCQ (1 Mark)	SAQ (5 Marks)	LAQ (10 Marks)
1.	***Nizam-e-Hazm* (Digestive system)** نظام ھضم	I	15	0	1	1
	Tamheed-e-nizam-e-hazm (introduction of digestive system) تمہید نظام ھضم			No	Yes	Yes
	Khurd beeni sakht of ghudood-e-luabiya (histological structure of salivary glands), luab-e-dahan ki tarkeeb (composition of saliva) غدود لعابیہ کی خوردبینی ساخت،لعاب دھن کی ترکیب			No	Yes	Yes
	Tarssho aur afaal (secretion of saliva and functions) لعاب دہن کاترشح اور افعال			No	Yes	Yes
	Rutubat-e-maaddi (gastric juice) رطوبات معدی			No	Yes	Yes
	Rutubat-e-mayvi, aur rutubat-e-safravi ki tarkeeb,tarassho aur afaal (composition of succus entericus and bile secretion and their functions) رطوبات معوی اور رطوبات صفراوی کی ترکیب ، ترشح اور افعال			No	Yes	Yes
	Majra-e-ghizai ke harkat aur unke afaal (movements of alimentary canal and their functions مجریٰ غذائی کی حرکات اور انکے افعال			No	Yes	Yes
	Fuzla ki paidaish-o-iqhraj (formation of faeces and defecation) فضلہ کی پیداش و اخراج			No	Yes	Yes
	Jigar ki saaqht-o-afaal, (structure and & functions of liver) جگر کی ساخت و افعال			No	Yes	Yes
	hazm-e-nishashta (digestion of carbohydrate), ھضم نشاستہ			No	Yes	Yes
	hazm-e- shorain (digestion of protein) ھضم شورین			No	Yes	Yes
	andhazm-e-shaham (digestion of lipids) ھضم شحم			No	Yes	Yes
	paani ka injezab (absorption of water) پانی کا انجذاب			No	Yes	Yes
2.	***Nizam-e-Tanaffus* (Respiratory system)** نظام	I	15	0	1	1

	تنفس					
	Mukhtalif tanaffussi aaza ki tamheed (introduction of respiratory system/organs)مختلف تنفسی اجزاء کی تمہید			No	Yes	Yes
	Aaza –i- tanaffys ki Khurd beeni sakht (histological structure) اجزائے تنفسی کی خوردبینی ساخت			No	Yes	Yes
	Uzlaat-e-tanaffuss aur unke afaal (respiratory muscles & functions of respiratory system/organs) عضلات تنفس اور انکے افعال			No	Yes	Yes
	Oxygen aur carbon di oxide ki muntaqeeli (transport of oxygen & carbon dioxide) آکسیجن اور کاربن ڈائی آکسائڈ کی منتقلی			No	Yes	Yes
	Riya aur insaja may gason ka tabadila (gaseous exchange in lungs and tissues) ریہ اور انسجہ میں گیسوں کا تبادلہ			No	Yes	Yes
	Tanaffuss ke marakiz (centers of respiration) تنفس کے مراکز			No	Yes	Yes
	Masnooi tanaffuss aur inke mukhtalif tareeqe (artificial respiration and its methods) مصنوعی تنفس اوران کے مختلف طریقے			No	Yes	Yes
	Jasamat-e-reviya (pulmonary volume) جسمات ریویہ			No	Yes	Yes
	Waqaat-e-reviya (pulmonary capacities) وقعت ریویہ			No	Yes	Yes
	Usre tanaffuss (dyspnoea)عسر تنفس			No	Yes	Yes
	Qillat-e-baad (anoxia) قلت باد			No	Yes	Yes
	Dushwaar-e-tanaffuss (apnoea)دشوار تنفس			No	Yes	Yes
	Izdiyad-e-tanaffuss (hypercapnia)ازدیاد تنفس			No	Yes	Yes
	Sat-he-martafa aur gehre paani ke feliyati asraat (physiological effect of high altitude & under water) سطح مرتفع اور گہرے پانی کے فعلیاتی اثرات			No	Yes	Yes
3.	***Nizam-e-Iqhraj* (Excretory system)** نظام اخراج	II	15	5	2	0
	Kulliya ki saqht-o-afaal (Structure and function of kidney) کلیہ کی ساخت وافعال			Yes	Yes	No
	Aljihazul mujawiru lilkubaiba (juxta--glomerular apparatus and renin- angiotensin system) الجہازالمجاورہ للکبیبہ اور نظام رینن و انجیوٹنسن			Yes	Yes	No
	Paidaish-e- bowl, tarkeeb-e-bowl, aur miqhdaar-e-bowl (urine formation, quantity & concentration of urine) پیدائش بول ، ترکیب بول اور مقدار بول			Yes	Yes	No
	Renal regulation of fluid and electrolytes and acid-base balance			Yes	Yes	No

	توازن کہارل اور توازن حمضی قلوی میں کلیہ کا کردار					
	iqhraj-i- bowl aur iska mechania (micturition and its mechanism) اخراج بول اور اسکامیکانیہ			Yes	Yes	No
	Masana aur uski Kharabiyan (urinary bladder and its abnormalities) مثانہ اور اس کی خرابیاں			Yes	Yes	No
	Artificial kidney, dialysis and renal transplantation مصنوعی کلیہ،ڈائلیسس اورزَرْع الکلیہ			Yes	Yes	No
	Renal function tests اخْتِبار وَظيفَة الكُلْيَة			Yes	Yes	No
	Unani conepts of idrar-e-bowl ادرار بول کا یونانی طبی مَفهُوم			Yes	Yes	No
4.	***Nizam-e-jild* (Integumentary system)** نظام جلد	II	10	5	1	0
	Jild ki sakht aur afaal (structure and functions of skin) [integument], جلدکی ساخت و افعال			Yes	Yes	No
	Paseena (sweat) پسینہ			Yes	Yes	No
	Hararat-e-badaniya ka tavazun, (regulation of body temperature) حرارت بدنیہ کا توازن			Yes	Yes	No
	Ghair tabiyyee hararat aur qillate-hararat (abnormal and sub-normal temperature). غیر طبعی حرارت و قلت حرارت			Yes	Yes	No
5.	***Nizam-e-Aasab* (Nervous system)** نظام اعصاب	II	15	5	2	0
	Organization of nizam-e-aasab (nervous system)تنظیم نظام اعصاب			Yes	Yes	No
	Naseej-e- asabi (neural tissue)نسیج عصبی			Yes	Yes	No
	Leef-e= asabi (Nerve fibers) لیف عصبیی			Yes	Yes	No
	Mashbak/ittisal (synapse):اتصال/مشبک			Yes	Yes	No
	Asabi mursalat (neurotransmitters) عصبی مرسلات			Yes	Yes	No
	Markazi nizam-e- asab (Central nervous system) مرکزی نظام اعصاب			Yes	Yes	No
	Assabeel-o shabkiya hissi (Sensory pathways and tracts) السبیل و شبکیہ حسی			Yes	Yes	No
	Nizam-e-harkiyah (Motor system) نظام حرکیہ			Yes	Yes	No
	Alfailur-rudood (Reflexes)الفعل ردود			Yes	Yes	No
	Muqheeqh uqda-e qaidiyyah (Cerebellum & basal ganglia)مخیخ اور عقدہ قعدیہ			Yes	Yes	No
	nizame asabi la iradi (Autonomic nervous system) الجهاز العصبي اللاإرادي			Yes	Yes	No
	nuqha (Spinal cord)نخاع			Yes	Yes	No
	maseerutus sailunuqhayi (Cerebero-spinal			Yes	Yes	No

	fluid)مسیرۃ السائل النخاعی					
	Al naum (Physiology of sleep) النوم			Yes	Yes	No
	Waj-o- alam (Physiology of pain) وجع و الم			Yes	Yes	No
	EEG & nerve tests			Yes	Yes	No
	Unani concept of quwwat-e-nafsaniyyah قوت نفسانیہ			Yes	Yes	No
	Quwwat-e zaiqah wa shammah (the taste and smell sensation) قوت ذائقہ و شامہ			Yes	Yes	No
	Uzn (Ear) اذن			Yes	Yes	No
	Ghisha-e tabli aur azeematusameiyyah (Tympanic membrane and the ossicular system) غشاء طبلی اور عظیمات السمعیہ			Yes	Yes	No
	Cochlea قوقلیا			Yes	Yes	No
	Saut (Sound) صوت			Yes	Yes	No
	Mechania-e quwwat-e-saut-e-markazi (Central auditory mechanisms) میکانیہ قوت صوت مرکزی			Yes	Yes	No
	Hearing test			Yes	Yes	No
	Eye عین			Yes	Yes	No
	Ratubat-e- ain (Fluid system of the eye) رطوبات عین			Yes	Yes	No
	Photochemistry of vision الكيمياء الضوئية للرؤية			Yes	Yes	No
	Ruyiyat ka mechania (Physiology of vision) رؤیت کا میکانیہ			Yes	Yes	No
	Harkat-e-ain (Eye movements) حرکات عین			Yes	Yes	No
6.	***Nizam-e-ghudood* la qanatiyah (Endocrine system)**	III	15	5	0	1
	Ghudood-e-la qanatiyah (endocrine gland) غدودلا قناتیہ			Yes	No	Yes
	Tanzeem-e-afraz rasilat (regulation of hormones) تنظیم افرازرسیلات			Yes	No	Yes
	Rasilat ka mekaniya-i- amal (Mechanism of action of hormones) رسیلات کا میکانیہ عمل			Yes	No	Yes
	Rasilat aur istihala-e- kailshium (Hormones and calcium metabolism) رسیلات اور استحالہ کیلشیم			Yes	No	Yes
	Taht-us-sarir (hypothalamus)تحت السریر			Yes	No	Yes
	Ghudda nukhamiyah (pituitary gland) غدہ نخامیہ			Yes	No	Yes
	Rasila-e-namu (growth hormone)رسیلہ نمو			Yes	No	Yes
	Ghudda-e-nukhmiya muaqqhar (posterior pituitary) غدہ نخامیہ مؤخر			Yes	No	Yes
	Ghudda-e-darqiyyah (thyroid gland) غدہ درقیہ			Yes	No	Yes
	Ghudda-e- kazriyyah (adrenal glands) غدہ کزریہ			Yes	No	Yes
	Banqiras (pancreas):بانقراس			Yes	No	Yes

	Ghudda sa'atariyyah (thymus) and ghhudda-e-sanobariyyah (pineal gland): غدہ صعتریہ اور غدہ صنوبریہ			Yes	No	Yes
	Thyroid function tests			Yes	No	Yes
	Endocrine consequences and metabolism			Yes	No	Yes
7.	***Nizam-e-tauleed* (Reproductive system)**	III	15	0	1	1
	Sex differentiation & determination			No	Yes	Yes
	Bulooghat (puberty): بلوغت			No	Yes	Yes
	Nizam-e-tauleed mardana (male reproductive system) نظام تولید مردانہ			No	Yes	Yes
	Rasila-e-khusya (testosterone) رسیلہ خصیہ			No	Yes	Yes
	Ghudda-e-madhi(prostate) غدہ مذی			No	Yes	Yes
	Nizame tawleed zanana(female reproductive system)) نظام تولید زنانہ			No	Yes	Yes
	Rasila muwallid-i- bayda (oestrogen) and rasila mu'in al-haml (progesterone): رسیلہ مولد بایئدہ و رسیلہ معین حمل			No	Yes	Yes
	Hamal (pregnancy), wiladat (parturition) & ilban / amal-e-raza'at (lactation) حمل، ولادت و عمل رضاعت			No	Yes	Yes
	Iyas (menopause) ایاس			No	Yes	Yes
	Unani concepts of quwwat-e-tanasulliya قوت تناسلیہ کا طبی مفہوم			No	Yes	Yes

6 G(1) - Question Paper blueprint Paper I

A Question Sr. No	B Type of Question	C Question Paper Format
Q1	**Multiple choice Questions (MCQ)** 20 Questions 1 mark each All compulsory Must know 15 MCQ Desirable to know 3 MCQ Nice to know 2 MCQ	1. Topic number 1 2. Topic number 1 3. Topic number 1 4. Topic number 1 5. Topic number 1 6. Topic number 2 7. Topic number 2 8. Topic number 2 9. Topic number 2 10. Topic number 2 11. Topic number 3 12. Topic number 3 13. Topic number 3 14. Topic number 3 15. Topic number 3

		16. Topic number 3 17. Topic number 3 18. Topic number 3 19. Topic number 3 20. Topic number 3
Q2	**Short answer Questions (SAQ)** Eight Questions 5 Marks Each All compulsory Must know 7 SAQ Desirable to know 1 SAQ No Questions on Nice to know	1. Topic no. 1 2. Topic no. 3 3. Topic no. 3 4. Topic no. 4 5. Topic no. 5 6. Topic no. 5 7. Topic no. 6 8. Topic no. 6
Q3	**Long answer Questions (LAQ)** Four Questions 10 marks each All compulsory All questions on must know No Questions on Nice to know and Desirable to know	1. Topic no .2 2. Topic no 3. 3. Topic no 5. 4. Topic no 7.

6 G(2) - Question Paper blueprint Paper II

A Question Sr. No	B Type of Question	C Question Paper Format
.Q1	**Multiple choice Questions (MCQ)** 20 Questions 1 mark each All compulsory Must know 15 MCQ Desirable to know 3 MCQ Nice to know 2 MCQ	1. Topic number 3 2. Topic number 3 3. Topic number 3 4. Topic number 3 5. Topic number 3 6. Topic number 4 7. Topic number 4 8. Topic number 4 9. Topic number 4 10. Topic number 4 11. Topic number 5 12. Topic number 5 13. Topic number 5 14. Topic number 5

		15. Topic number 5 16. Topic number 6 17. Topic number 6 18. Topic number 6 19. Topic number 6 20. Topic number 6
Q2	**Short answer Questions (SAQ)** Eight Questions 5 Marks Each All compulsory Must know 7 SAQ Desirable to know 1 SAQ No Questions on Nice to know	1. Topic no. 1 2. Topic no. 2 3. Topic no. 3 4. Topic no 3 5. Topic no. 4 6. Topic no. 5 7. Topic no. 5 8. Topic no. 7
Q3	**Long answer Questions (LAQ)** Four Questions 10 marks each All compulsory All questions on must know No Questions on Nice to know and Desirable to know	1. Topic no .1 2. Topic no 2. 3. Topic no 6. 4. Topic no 7.

6 H - Distribution of Practical Examination

SN	Heads	Marks
1	Practical (Total Marks 100)	
	Spotting : Microscopic Identification of Histological Slides (05 Slides)	25
	Experiment: Urine Examination/Haematology Tests (any 01 Experiment)	20
	Measurements: Blood Pressure/ Spirometry/ Perimetry/Visual Field/ Ishihara Test/ Hearing Conduction Test (any 01 Measurement)	20
	Electrophysiology: ECG/EEG/NCT (any 01 Test)	25
	Record Book	10
2	Viva Voce	20
3	Internal	20
4	Electives	10
Total Marks		**150**

Table 7. Reference Books/ Resources:

Book		
S. No.	**Name of Book**	**Name of Author**
1	Human Physiology	C.C. Chatterjee - Medical Allied Agency
2	Textbook of Medical Physiology	Guyton & Hall - Harcourt Asia & Saunders
3	Essentials of Medical Physiology	Sembulingam - JP
4	Review of Medical Physiology	Ganong - McGraw Hill
5	Medical Physiology	Khurana - Elsevier
6	Physiology	Berne & Levy – Elsevier
7	Manafeul Aza	NCPUL, New Delhi
8	Darsi Manafeul Aza (Blood)	Ghulam Muntaqa
9	Darsi Manafeul Aza (General Physiology)	Ghulam Muntaqa
10	Manafeul Aza (Ghiza, Hazm, Istihala wa	Iqtidarul Hasan Zaidi

	Ikhraj)	
11	Manafeul Aza	Ansari Mohd Yusuf
12	Manafeul Aza	Javed Ahmad Lari
13	Manafeul Aza	Anwaar Ahmad Qureshi