STUDY GUIDE
2ND YEAR MBBS
Y2 B1

DEPARTMENT OF MEDICAL EDUCATION

CMH KHARIAN MEDICAL COLLEGE

Table of Contents

MISSION

Our mission is to educate and produce exemplary doctors who practice ethical patient centered health care, discover and advance knowledge and are responsive to the community needs.

VISION

To produce competent doctors equipped with sound knowledge based on scientific principles, imbued with ethics and moral values primed to serve the community through the profession.

Our aim is to

- Provide outstanding educational environment for medical students.
- Develop exemplary clinicians who are lifelong learners and provide the highest qualitycompassionatecareandservetheneedsoftheircommunityandthenation in the best traditions of medical profession.
- Ensure the highest ethical and professional standards in all of our deeds.

Exit Outcomes for the CKMC Graduate

At the end of five years MBBS degree program graduate of CMH Kharian Medical College should be able to:

Knowledge

- Integrate knowledge of basic and clinical sciences in disease prevention and promotion of health and well-being of community.
- Able to appraise varied information they would come across during professional work and testify innovative ideas to benefit human society through evidence-based health care practice

- Demonstrate scientific knowledge in all professional activities
- Demonstrate research skills which bring innovation and significance to health care practices.

Skills

- Able to perform physical examinations, formulate provisional diagnosis with appropriate investigations to identify specific problems.
- Perform various common procedures to diagnose and manage non critical clinical problems.
- Demonstrate competency in life saving procedures.
- Exhibit propensity of critical thinking, problem solving and lifelong self-directed learning skills.

Attitude

- Manifest ethical values and professionalism.
- Demonstrate professional attitude towards patients, their families, seniors and colleagues.
- Demonstrate dedication and professionalism when faced natural disasters in country.
- Demonstrate communication skills, inter professional skills and leadership.

knowledge	Skill	Attitude
Integrated knowledge of basic & clinical sciences	Communication skills	Ethical values
Patient centered care	Research skills	
Health promotion & disease prevention	Patient management skills	Professionalism
Community needs	Leadership skills	
	Critical thinking skills	

Introduction to the Study Guide

Dear Students,

We, at the Department of Medical Education, CMH Kharian Medical College, have developed this study guide especially for you. This study guide is an aid to

- Inform you how this part of your syllabus has been organized.
- Inform you how your learning programs have been organized in this block.
- Help you organize and manage your studies throughout the block
- Guide you on assessment methods, rules and regulations.
- Communicate information on organization and management of the block. This will help you to contact the right person in case of any difficulty.
- Define the objectives which are expected to be achieved at the end of the block.
- Identify the learning strategies such as lectures, small group discussions, clinical skills, demonstration, tutorial and case-based learning that will be implemented to achieve the block objectives.
- Provide a list of learning resources such as books, and journals for students to consult in order to maximize their learning.
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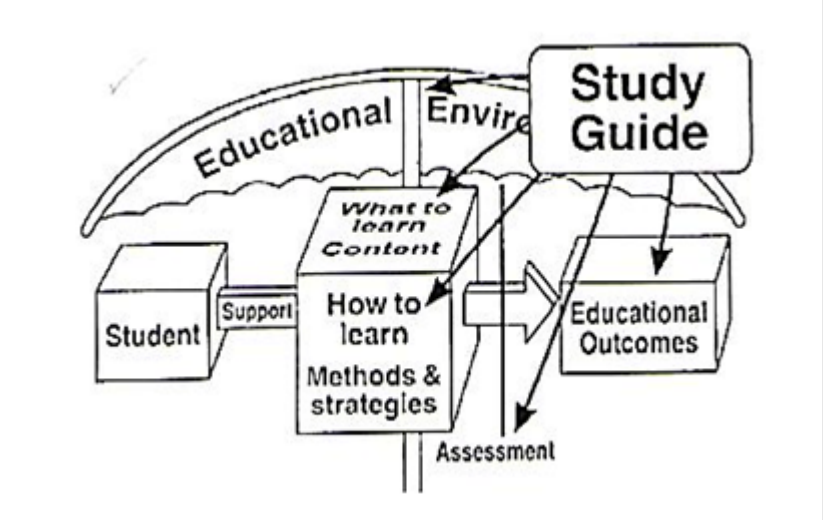


Figure 1 Objectives of study guide by Harden

Curriculum Integration

Medical college curriculum shall be organized in blocks of modules. The modules are named after body system for example a module of blood in a block. The key details are as follows:

1. There shall be three blocks in first year MBBS comprising modules.
2. The blocks shall be labeled as1, 2 and 3.
3. Each module in a block shall have a title. The name of the module shall represent the content taught and learned the majority of time in that module. Module shall be named after body systems.
4. The duration of three blocks shall vary between 8–11 weeks according to syllabus.
5. The syllabus shall be integrated horizontally around systems of the body.
6. There shall be vertical integration to the extent decided by the curriculum coordination committee.
7. Vertical integration shall be in case based learning sessions and in clinical lectures of basic sciences, scheduled in the structured training program.

Teaching and Learning Methods

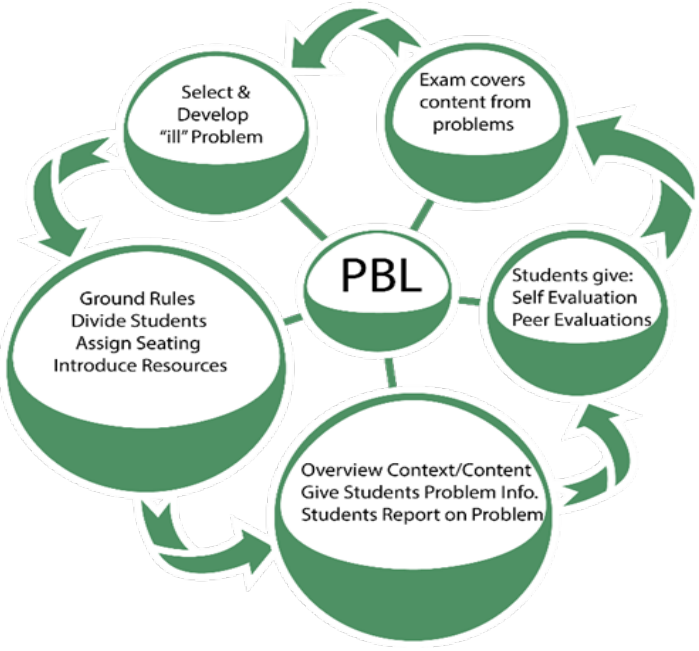
1: Small Group Discussions (SGD)

The topic will be taught in groups with the help of models and audiovisual aids. Pre-planned topics would help students to combine their wisdom in achieve learning objectives. Facilitator would be guiding to achieve learning objectives and making them on right track by clarify any misconception.

“Small group learning provides more active learning, better retention, higher satisfaction, and facilitates development of problem-solving and team-working abilities (Jahan, Siddiqui, AlKhouri, Ahuja, & AlWard, 2016).

2: Problem Based Learning (PBL)

This is group learning comprising of 8-10 students guided by a facilitator. For a specific problem given to students two sessions of 2 hours would be scheduled to achieve the learning objectives. In the first session students will discuss problem based upon their existing knowledge among the group and will produce a list of their learning objectives for further study. In the second session students share, discuss with each other to build new knowledge.



PBL is a self-directed learning and that type of educational strategy most likely produce doctors who are prepared for lifelong learning and able to meet the changing needs of their patients (Spencer & Jordan, 1999).

3: Large Group Interactive Session (LGIS)

These are meant to give overview of certain course content. They should be interactive so that students can not only gain knowledge but should completely understand it. Students may clarify the

difficult concepts in these sessions. The lecturer introduces a topic and explains the underlying phenomena through questions, pictures, videos of patient's interviews, exercises, etc. Students are actively involved in the learning process.

4: Self Directed Learning (SDL)

In this modern era of medical education, students assume responsibilities of their own learning according to the principles of adult learning. They can study independently, can share and discuss with peers, can take information from the sources of information college have like library, internet and teachers. Students will be provided time within the scheduled college hours for self-study.

5: Hands on Training

- **Lab session**

Histology, biochemistry, physiology practical will build skills in identification of normal histology of human body tissues. There would be test of these skills in OSPE exam.

- **Clinical Rotations**

The students will rotate in the clinical departments to see integration of knowledge into clinical practices.

Teaching and learning activities are meant to help students to gain new knowledge. It should be kept in mind that they are not meant to fully cover the objectives of the subject. It is therefore responsibility of students to attain more information to cover all objectives given in the overall objectives.

Class attendance and participation is of most important in gaining knowledge. If any help is needed module team can be contacted without any hesitation. Attendance will be strictly checked in different teaching activities. If attendance is less than 75%, students would not be allowed to sit for the examination.

Attendance in the examination is must and no students would be allowed to enter the examination area after starting the examination. In case of sickness, sick leaves from government/private hospitals or the emergency of the college hospital will only be entertained.

Assessment Format

Assessment is a goal-oriented process (Angelo, 1995). We assess in order to check whether the learning objectives set at the initiation of the program are met or not and to what extent (Amin, 2007).

No student will be allowed to sit in the annual examination if attendance is below 75% in theory and practical separately.

Assessment types

The assessment will be continuous. The purpose of continuous assessment is formative and summative.

Summative Assessment:

The marks of this type of assessment contribute in the final university result through internal assessment. It comprises:

- CBL/tutorial assessment
- Scheduled tests
- Sub-stages
- End of block exam
- Pre-annual exam

Scheduled tests and sub-stages will be conducted intermittently throughout the block. Their schedule will be intimated through the time tables.

The end of the block exam will be conducted after completion of weeks of instruction. It will comprise one theory paper and one practical exam for Anatomy, Physiology and Biochemistry. (Table of specifications (TOS) for exam has been provided)

Formative Assessment: Tests may be quizzes, surprise tests/written assignments/self-reflection by students during the teaching time but their marks will not be added to internal evaluation marks. The purpose of formative assessment is to provide feedback to the students, for the purpose of improvement and to teachers to identify areas where students need further guidance.

Internal Assessment

(Will be submitted to the university before professional exam)

- The weightage of internal assessment shall be 10 % in theory paper and 10 % in practical, in the annual professional examination (or 10 marks for 100 marks in theory and practical each)
- Scheduled tests, sub-stages, CBLs/tutorials, block examinations and pre-annual examinations, conducted by the college shall contribute towards internal assessment for professional examination.

Annual Professional Examination:

- The professional examinations schedule will be provided by NUMS.
- There will be two components of the final result

  (i) Examination-80 % (ii) Internal Assessment- 20 %
- There will be one theory paper and one Practical exam for Anatomy, Physiology and Biochemistry each. For practical the class will be divided into batches. Each batch will have practical exam of one subject on the specified day, according to schedule.
- Theory & Practical assessment shall be of 100 marks each in Anatomy, Physiology and Biochemistry, making a **total of 200 marks for each subject.**
- The Annual Theory paper shall be of 80 marks. 20 marks of internal assessment of theory papers, conducted throughout the year will be added to it, to make annual theory assessment of 100 marks. Similarly, the annual practical examination will be of 80 marks. 20 marks of internal evaluation of practical exams, conducted throughout the year will be added to it, to make annual practical assessment of 100 marks.
- The pass score shall be 50 out of 100, in theory and practical separately.

Schedule of examinations:

a) Continuous assessments schedule

Schedule provided by each department in Time table.

b) Formative tests: Throughout the block

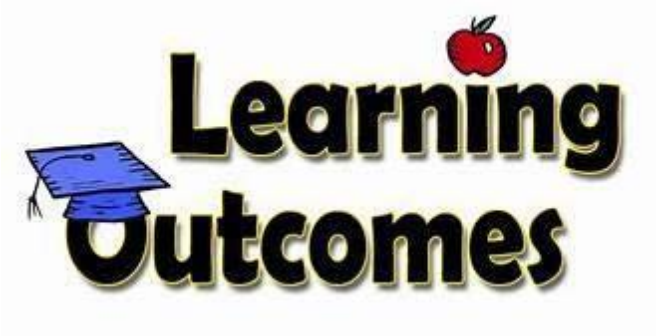
Block Development Committee

Chairperson curriculum committee	Principal Brig (Retd) Shoaib Nayyar Hashmi
Director Medical education	Dr Aasma Qaiser
Block Planner	Dr Aasma Qaiser
Resource Persons	**Anatomy: Prof. Lt. Col. Shafqat Ali** **Physiology: Dr Aiman Farogh Anjum** **Biochemistry: Prof. Dr. Aleem Ul Haq** **Medicine: Maj Usman** **Surgery: Dr Waqas**
Study Guide Developed By	Department of Medical Education CMH Kharian Medical College Kharian

Structured Summery of Y2B1

Block Code	Y2B1
Pre requisite Block	As per admission criteria
Duration	10 weeks
Rationale	The Y2B1 block is taught as the first block after the students clear their first professional exam. In a period of 10 weeks, the block aims to form a basis for knowledge and skills related to the Gastro intestinal & renal Anatomy, Physiology and Biochemistry and applied clinical subjects that are essential for any undergraduate medical student. The concepts taught to the students in this block will help to lay a foundation for their knowledge of GIT & Renal system
Anatomy	Developmental and microscopic Anatomy of GIT and urinary system, Gross anatomy of Abdomen, Pelvis & Perineum.
Physiology	GIT: Motor and secretory functions of GIT

	Hormones of GIT Pathophysiological basis of Common disorders of GIT Renal: Water Balance GFR and its regulation Formation, dilution and concentration of urine Acid Base Balance Rennin- angiotensin system Pathophysiological basis of Common disorders Renal system
Biochemistry	Biochemistry of digestive tract & electrolyte balance
Surgery	Common Surgical conditions relevant to anatomy of GIT and Urinary system.
Medicine	Anemias, Bleeding disorders and Transfusion reaction
BSP	Communication skills, professionalism, leadership and management, ethics



Knowledge	• Describe the gross anatomical features of Cerebrum, Midbrain, Pons, Medulla and Spinal cord • Describe the sensory and motor parts of nervous system • Describe the major levels of central nervous system along with their functions • Describe the integrative function of nervous system • Describe the blood cerebrospinal fluid and blood brain barriers • Describe the structure of Nerve and explain the myelination of nerve fiber

	• Describe the ascending and descending tracts of brain stem • Describe analgesia system in brain & spinal cord • Describe the mechanism of consolidation of memory • Describe the functions of autonomic nervous system • Explain the Physiology, anatomy and pathogenesis of Head & neck and special sense problems. • Apply basic sciences to understand the causes of common Head & neck and special sense problems. • Explain the structural & developmental organization of GIT. • Explain the composition, functions, mechanism & control of following gastrointestinal secretions: salivary, gastric, pancreatic, biliary, small & large intestines. • Describe the mechanism of absorption of various nutrients and their role in malabsorption syndrome. • Explain the physiological anatomy, biochemistry functions and dysfunctions of Liver. • Explain the GIT hormones (structure, function) & their role in secretion and motility. • Describe the chemical nature, biosynthesis and the physiological functions of hormones on their target organs.
	• Draw a labeled diagram of the identified structures with the help of eosin and hematoxylin pencils on the histology notebooks • Mark the main anatomical land marks on skull • Dissect various parts of head and neck and special senses, and related structure

Skill	• Demonstrate their gross Anatomy and relationship to each other. • Identify the histological features of all the endocrine glands under microscope. • To perform all the steps of blood glucose estimation in the lab. • Dissect various parts of GIT, and related structures including peritoneum, to demonstrate their gross Anatomy and relationship to each other. • Identify different organs of GIT under microscope and on model.
Attitude	• Demonstrate the effective attitude towards the colleagues • Demonstrate a professional attitude, team building spirit and good communication skills • Observe lab safety rules

Course content:

2nd YEAR MBBS

Block 1 CODE Y2B1

In case of online classes MIT and Assessment will be online via zoom meeting and Google classroom

Anatomy

GIT MODULE

S.No	Topic	Learning outcomes	Learning Objectives	MIT	Assessment Tool
		By the end of this block, students should be able to:			
1.	Development of foregut	Correlate the embryological basis of common congenital anomalies related with development of Fore, mid and hindgut	• Describe the development of primitive gut. • List divisions of primitive gut along with their extent • List derivatives of foregut • Describe the development of esophagus • Correlate the tracheoesophageal fistula, esophageal stenosis and hiatal hernia with its normal development • Describe the development of stomach with special reference to its rotations and relocation of both vagi • Enlist derivatives of ventral and dorsal mesentery of foregut • Explain the formation of lesser sac • Explain pyloric stenosis by applying the embryological knowledge. • Describe the development of duodenum • Describe the development of liver, biliary apparatus and spleen • Explain the origin of pancreatic buds and correlate them with their derivatives in adult pancreas • Explain annular pancreas by applying your knowledge of normal development of pancreas. • Explain occurrence of accessory pancreatic tissue by applying your knowledge	LGIS	MCQ SEQ SAQ Viva Voce

			of normal development of pancreas.		
2.	Development of midgut	"	• Enlist derivatives of midgut • Describe physiological herniation with emphasis upon rationale behind its occurrence and reduction • Correlate the rotation of midgut loop with definitive positioning of mid gut derivatives in abdomen • Enlist common congenital anomalies of midgut • Correlate development of midgut with abnormalities of mesenteries, vitelline duct abnormalities, gut rotation defects, gut atresia & stenosis • Differentiate between omphalocele and gastroschisis on the basis of embryology	LGIS	MCQ SEQ SAQ Viva Voce
3.	Development of hindgut	"	• Enlist derivatives of hindgut • Define cloaca • Describe the partitioning of cloaca and its consequences • List derivatives of anorectal canal • Describe the development of derivatives of anorectal canal • Correlate the anomalies of anorectal region of hindgut with normal development	LGIS	MCQ SEQ SAQ Viva Voce
4.	Development of GIT	Correlate the knowledge of development of GIT with three-dimensional	Identify parts of developing Gastrointestinal system on given models and diagrams showing different developmental phenomena	LGIS	OSPE Viva Voce

		spatial arrangement of developing structures with help of models.			
5.	Introduction to GIT histology	Appraise the light microscopic structure of different components of digestive system and predict functional outcomes of their altered structure.	Describe the general structure plan of alimentary canal	LGIS	MCQ SEQ SAQ
6.	Histology of esophagus		• Correlate various layers of esophagus with general plan of GIT • Differentiate between 3 parts of esophagus microscopically	LGIS	MCQ SEQ SAQ Viva Voce
7.	Histology of Stomach		• Differentiate between a gastric gland and pit • Enumerate cells forming gastric glands • Correlate the structure and function of cells forming gastric glands • Compare the histological structure of cardia, fundus and pylorus of stomach on the basis of glands • Correlate a case of gastritis with pernicious anemia on basis of histology	LGIS	MCQ SEQ SAQ Viva Voce
8.	Histology of small intestine		• List and justify the modifications of small intestine working as adaptive measures for carrying out its functions effectively • List the cells forming intestinal epithelium • Describe the light microscopic structure of duodenum, jejunum and ileum • Tabulate the histological differences between duodenum, jejunum and ileum	LGIS	MCQ SEQ SAQ Viva Voce
9.	Histology of large intestine		• Describe the histological structure of large intestine	LGIS	MCQ SEQ

			and correlate it with its functions • Justify the increase in number of goblet cells in comparison with the absorptive cells down the tract		SAQ Viva Voce
10.	Histology of liver & gall bladder		• Describe the histological structure of liver • Illustrate the three concepts/ interpretations of liver structure/microscopic functional units (mentioning the basis/ emphasis of each concept/ interpretation) • Describe the light microscopic structure of gallbladder	LGIS	MCQ SEQ SAQ Viva Voce
11.	Histology of Pancreas		Describe the light microscopic structure of parenchyma, stroma and duct system of pancreas	LGIS	MCQ SEQ SAQ Viva Voce
12.	Gross Anatomy of Anterior abdominal wall	Elucidate the gross anatomy of anterior abdominal wall to gain access to various abdominal organs & to analyze common relevant clinical problems in future training and practice	• Identify nine regions of abdominal cavity to locate the topographic arrangement of underlying abdominal organ. • Identify the layers of anterolateral abdominal wall in the prosected specimen. • Explain the clinical importance of membranous layer of superficial fascia with anatomical reasoning. • Describe the origin, insertion, & nerve supply of muscles of anterolateral abdominal wall and demonstrate them in the prosected specimen / model. • Correlate the attachment of muscles of anterolateral abdominal wall with their actions	SGD	MCQ SEQ SAQ Viva Voce OSPE

			• Describe the formation of rectus sheath at different levels of abdomen and enlist its contents. • Describe the blood supply, nerve supply & lymphatic drainage of anterolateral abdominal wall • Locate various surgical incisions commonly used to gain entry into the abdominal cavity		
13.	Gross Anatomy of Inguinal Canal	Apply the knowledge of Anatomy of inguinal canal in differentiating between various types of inguinal hernias	• Describe the extent and enlist the structures forming various walls of inguinal canal in correlation with muscles and fasciae of anterior abdominal wall. • Locate the superficial & deep inguinal rings on the surface of given subject/manikin • Analyze the functions & mechanics of inguinal canal • Enlist the structures passing through the inguinal canal in males and females • Define hernia. Name different parts of a hernial sac. • Differentiate between direct & indirect inguinal hernia with regards to their relation with age, predisposing factor, frequency, coverings on exit from abdominal cavity, course, & exit from anterior abdominal wall • Define spermatic cord. Describe its extent, coverings & contents	SGD	MCQ SEQ SAQ Viva Voce OSPE
14.	Gross Anatomy of	Apply the anatomical	• Explain the significance of pampiniform plexus	SGD	MCQ SEQ SAQ

	External Male genitalia	knowledge of male external genitalia in identifying common clinical problems related with them	• Correlate the descent of testis to its blood supply, lymphatic drainage and innervations. • Define hydrocele, hematocele & varicocele • Justify the more common occurrence of varicocele on left side of body with anatomical reasoning		Viva Voce OSPE
15.	Gross Anatomy of Peritoneum	Interpret the common clinical problems associated with peritoneal cavity with relevance to its gross features	• Define peritoneum & its layers. • Enumerate intraperitoneal, extraperitoneal, & secondarily retroperitoneal organs. • Define following with one example each: Mesentery, Omentin, Ligaments, Folds, Recesses, Pouches, Gutters • Trace the vertical and horizontal disposition of peritoneum and demonstrate it on the model of abdomen and pelvis. • Describe the role of visceral and parietal layers in peritoneal adhesions, ascites and paracentesis • Demonstrate the attachment of greater & lesser omentum in the given model. • Describe the walls and recesses of omental bursa • Demonstrate the structures crossed by root of mesentry in the prosected specimen. • Demonstrate the differences in arrangement of peritoneum in males and females in the given model.	SGD	MCQ SEQ SAQ Viva Voce OSPE

			• Explain the role of greater omentum as abdominal policeman • Explain peritoneal infection & peritoneal pain using your knowledge of gross anatomy of peritoneum		
16.	Gross Anatomy of Abdominal esophagus	Elaboratethe gross anatomy of esophagus to explain common clinical problems related with it	• Describe abdominal esophagus regarding its relations, blood supply, nerve supply and lymphatic drainage of esophagus. • Explain achalasia of cardia, GERD and bleeding esophageal varices using your knowledge of gross anatomy	SGD	MCQ SEQ SAQ Viva Voce OSPE
17.	Gross Anatomy of Stomach	Elaborate the gross anatomy of stomach to explain common clinical problems related with it	• Demonstrate the position & gross features of stomach on the given model • Mark the stomach on the surface of given subject • Identify the omenta attached to stomach on a given model. • Enumerate the structures lying in stomach bed • Enumerate the structures endangered by perforating ulcer of posterior wall of stomach • Describe the blood supply, nerve supply and lymphatic drainage of stomach.	SGD	MCQ SEQ SAQ Viva Voce OSPE
18.	Gross Anatomy of Small Intestine	Apply the knowledge of gross Anatomy of small intestine in identifying the relevant common clinical presentations	• Identify the gross features of duodenum, jejunum & ileum on the given model. • Identify the structures in relation with duodenum, jejunum, & ileum on the prosected specimen/model • Explain the common sites and the effects of perforation of ulcers affecting different parts of duodenum applying	SGD	MCQ SEQ SAQ Viva Voce OSPE

		in training and practice	your knowledge of gross anatomy • Differentiate between gross features of jejunum and ileum in tabulated form		
19.	Gross Anatomy of Large intestine	Apply the knowledge of gross Anatomy of large intestine in appraising the relevant common clinical presentations in training and practice	• Differentiate between small and large intestine on gross inspection • Explain the topographic Anatomy of large intestine with the help of a model • Describe the location of ileocecal valve • Explain the clinical importance of variable positions of appendixwith anatomical reasoning. • Mark the McBurney point on the given model / manikin • Analyze the clinical presentation of a scenario of appendicitis applying your knowledge of gross anatomy • Define diverticulosis, volvulus, intussusception, cecostomy, & colostomy	SGD	MCQ SEQ SAQ Viva Voce OSPE
20.	Blood supply of intestinal tract	Comprehend the blood supply to the intestinal tract while ascertaining the parts prone to ischemic effects of occlusion of various blood vessels	• Describe coeliac trunk with reference to its origin, branches and distribution • Describe superior mesenteric artery with reference to its origin, branches and distribution • Describe inferior mesenteric artery with reference to its origin, branches and distribution • Correlate the parts of intestinal tract derived from fore, mid and hindgut with their blood supply from relevant arteries • Discuss the anatomical basis of clinical problems	SGD	MCQ SEQ SAQ Viva Voce OSPE

			occurring due to occlusion of GIT blood vessels		
21.	Gross Anatomy of Hepatic portal system	Justify the clinical presentation of portal hypertension with anatomical reasoning	• Describe the formation, significance & tributaries of portal vein. • Describe the communications between portal & systemic systems (sites of porto-systemic anastomosis) mentioning the names of veins involved • Explain the role of porto-systemic anastomosis in portal hypertension • Analyze a case of portal hypertension with anatomical reasoning.	SGD	MCQ SEQ SAQ Viva Voce OSPE
22.	Gross Anatomy of Liver	Comprehend the gross anatomy of liver to explain common clinical problems related with it.	• Describe the position, lobes, size, shape, coverings and ligaments of liver. • Mark the lobes, borders, surfaces, impressions of surrounding viscera & peritoneal reflections on liver • Describe the dual blood supply lymph drainage and nerve supply of liver • Discuss the concept of hepatic lobectomies and segmentectomy with anatomical reasons	SGD	MCQ SEQ SAQ Viva Voce OSPE
23.	Gross Anatomy of Extra hepatic biliary apparatus	Comprehend the gross anatomy of extra hepatic biliary apparatus to explain common clinical problems related with it.	• Enumerate the components of Intra & Extra Hepatic Biliary Systems • Describe the appearance, relations and blood supply of gall bladder • Describe the formation, course and termination of common bile duct • Identify the right & left hepatic ducts, common hepatic duct, cystic ducts,	SGD	MCQ SEQ SAQ Viva Voce OSPE

			bile duct in the given model / specimen • Explain the gall stones, acute cholecystitis, cholecystectomy by applying your knowledge of gross anatomy • Justify the referred pain of cholecystitis with anatomical reasoning		
24.	Gross Anatomy of Pancreas	Correlate the gross anatomy of pancreas to anatomical basis of common clinical problems related with it.	• Identify the location, parts & relations and ducts of pancreas in the given model / specimen • Describe the blood supply, nerve supply, lymphatic drainage of pancreas. • Correlate the clinical scenario of obstructive jaundice with cancer of head of pancreas & bile duct. • Justify the referred pain of acute pancreatitis with anatomical reasoning	SGD	MCQ SEQ SAQ Viva Voce OSPE
25.	Gross Anatomy of Spleen	Correlate the gross anatomy of spleento anatomical basis of common clinical problems related with it.	• Identify the gross relations of spleen on the model / specimen • Describe location, blood supply, nerve supply& lymphatic drainage of spleen, • Justify the direction of splenomegaly with anatomical knowledge of its ligaments	SGD	MCQ SEQ SAQ Viva Voce OSPE
26.	Surface Anatomy	Utilize the knowledge of topography of abdominal organs in plotting the same on body surface and inferring	• Mark transpyloric, intercristal, subcostal and midclavicular planes on the abdomen of subject/model for delineation of abdominal regions • Mark the following on the surface of given subject: o Stomach o Liver	SGD	MCQ SEQ SAQ Viva Voce OSPE

		relevant clinical presentations.	o Pancreas o Duodenum o Spleen o Large intestine o McBurney's point		
RENAL MODULE					
S.No	**Topic**	**Learning outcomes**	**Learning Objectives**	**MIT**	**Assessment Tool**
		By the end of this block, students should be able to:			
27.	Development of kidneys	Apply the knowledge of development of kidneys, ureter, urinary bladder and urethra in analyzing the relevant congenital anomalies	• Enlist the sources of urinary system • Enlist three models of renal development • Interpret the following stages of development of kidneys briefly a. Pronephros b. Mesonephros c. Metanephros Describe the development of definitive kidney with reference to the sources of different parts of uriniferous tubule, rotation and ascent of kidneys Correlate following congenital anomalies with normal development a. Horseshoe kidney b. Pelvic kidney c. Poly cystic kidneys d. Ectopic kidney e. Agenesis of kidney	LGIS	MCQ SEQ SAQ Viva Voce
28.	Development of ureter, urinary bladder and urethra		• Enumerate different parts and derivatives of urogenital sinus • Enlist the sources of ureter, urinary bladder and urethra • Describe the development of urinary bladder • Explain the relative position of ductus deferens	LGIS	MCQ SEQ SAQ Viva Voce

			and ureter with embryological reasoning • Correlate various urachal anomalies, exstrophy of bladder and exstrophy of cloaca with normal development		
29.	Development of urinary system	Correlate the knowledge of development of urinary system with three-dimensional spatial arrangement of developing structures with help of models.	Skill: Identify parts of developing urinary system on given models and diagrams showing different developmental phenomena	LGIS	OSPE Viva Voce
30.	Histology of Kidney	Explainthe light microscopic structure of different components of urinary system and predict functional outcomes of their altered structure.	• List parts of a uriniferous tubuleand glomerulus • Locate the different parts of uriniferous tubule in cortex and medulla of kidney topographically • Describe the light microscopic structure of different parts of uriniferous tubule with special reference to epith • Differentiate between cross section of PCT and DCT	LGIS	MCQ SEQ SAQ Viva Voce
31.	Histology of ureter and urinary bladder		Describe the histological structure of ureter(upper and lower parts)and urinary bladder	LGIS	OSPE Viva Voce
32.	Gross Anatomy of Kidneys and suprarenal glands	Comprehend the gross anatomy of kidney to explain common clinical	• Describe the gross features of kidney, relations, and its coverings • Draw and label the relations of anterior and posterior surfaces of both kidneys • Identify the impressions of surrounding structures on	SGD	MCQ SEQ SAQ OSPE Viva Voce

		problems related with it	both kidneys in the given model. • Describe the blood supply, nerve supply, & lymphatic drainage of kidney • Describe the structures involved in perinephric abscess with their anatomical relations • Explain the anatomical basis of typical renal colic and renal transplantation • Describe location, gross features, relations, blood supply, nerve supply, & lymphatic drainage of suprarenal glands • Explain surgical significance of renal fascia and separate compartment for suprarenal gland		
33.	Gross Anatomy of Ureters	Apply the knowledge of ureteric Anatomy in appraising the commonly occurring conditions related to it	• Describe the gross features, relations, & course of both ureters on the model / specimen while mentioning its constrictions. • Describe the blood supply and venous drainage of ureter. • Mark the ureter on the surface of given subject • Explain the cases of ureteric stones with anatomical reasoning.	SGD	MCQ SEQ SAQ OSPE Viva Voce
34.	Gross Anatomy of Lumbar vertebral column and nerves of posterior abdominal wall	Comprehend the basic anatomy of lumbar vertebral Column and related soft nervous tissues to	• Describe the fascia of posterior abdominal wall • Distinguish lumbar vertebrae from cervical & thoracic vertebrae • Describe anatomical features of a typical lumbar vertebra • Explain the anatomical basis of clinical presentation of nerve root pain, herniated	SGD	MCQ SEQ SAQ OSPE Viva Voce

		identify the likely source of pain and pathologic processes causing it.	intervertebral discs, & narrowing of spinal canal. • Correlate the compression & injury of spinal nerve to the basic anatomy of intervertebral foramina. • Define Spondylolisthesis, lumbar spinal stenosis • Describe the formation, relations and branches of lumbar plexus • Demonstrate the nerves of posterior abdominal wall in the given model.		
35.	Gross Anatomy of Muscles of posterior abdominal wall	Correlate the gross anatomy of posterior abdominal wall to anatomical basis of common clinical problems related with it.	• Identify the origin, insertion, nerve supply and actions of muscles of posterior abdominal wall in prosected specimen • Describe the fascial lining of the abdominal walls • Analyze the anatomical basis of a case of psoas abscess and its spread	SGD	MCQ SEQ SAQ OSPE Viva Voce
36.	Gross Anatomy of Major vessels of posterior abdominal wall	Analyze the presentation of clinical conditions associated with major abdominal vessels on the basis of anatomical knowledge	• Describe the extent, relations, branches and their distribution regarding abdominal aorta • Mark the abdominal aorta in the given subject. • Describe the obliteration of abdominal aorta & iliac arteries. • Explain formation, & tributaries of inferior vena cava • Identify the abdominal relations of inferior vena cava in the given model. • Explain the collateral routes for abdominopelvic	SGD	MCQ SEQ SAQ OSPE Viva Voce

			venous blood & compression of inferior vena cava.		
37.	Gross Anatomy of Lymphatic drainage of abdomen	Explain the continuity of abdominal lymphatic system with that of other regions with reference to spread of malignancy.	• Name the groups of lymph nodes draining the abdomen. • Describe the terminal group of lymph nodes around abdominal aorta Describe the lymphatic trunks, cisterna chili & commencement of the thoracic duct. • Differentiate between the location and area of drainage of pre and para aortic lymph nodes • Explain the continuity of abdominal lymphatic system with other regions with reference to spread of malignancy an infection of various abdominal organs	SGD	MCQ SEQ SAQ OSPE Viva Voce
38.	Gross Anatomy of Pelvic walls	Comprehend the significant anatomy of pelvic walls in relevance to the clinical problems.	• Demonstrate the boundaries of true and false pelvis in the given model. • Explain the bony landmarks & sites of muscular attachments on sacrum • Differentiate b/w anatomical features of male & female pelvis in the given model • Demonstrate the orientation of pelvic girdle. • Demonstrate the features of bony pelvis in the given model • Demonstrate boundaries of pelvic inlet and pelvic outlet • Describe the type, articulations, ligaments & movements of joints of pelvis. • Describe anatomical basis of sacroiliac joint diseases	SGD	MCQ SEQ SAQ OSPE Viva Voce

			• Explain anatomy of complications of pelvic fractures • Enumerate the structures forming pelvic diaphragm. • Describethe origin, insertion, nerve supply & actions of muscles of pelvic walls & floor • Explain the functional significance of pelvic floor in females • Analyze the clinical presentation of a case of injury to pelvic floor with anatomical reasoning • Demonstrate the line of attachment of pelvic peritoneum on the given model.		
39.	Gross Anatomy of Pelvic organs	Analyze the anatomical basis of common clinical conditions related to various pelvic organs in both males and females	• Describe relation, blood supply, lymphatic drainage and nerve supply of sigmoid colon • Describe the relations, peritoneal reflections, curvatures, blood supply, lymphatic drainage& nerve supply of rectum • Correlate blood supply of rectum with the arrangement of internal hemorrhoids • Identify parts and surfaces of urinary bladder on the given model • Describe the gross features, peritonealcovering, blood supply nerve supply and lymphatic drainage of urinary bladder • Differentiate between the relations of urinary bladder in models of both genders.	SGD	MCQ SEQ SAQ OSPE Viva Voce

			• Identify the location and relations of vas deferens, seminal vesicles & ejaculatory ducts on a model • Explain the Anatomy of prostate with reference to its surfaces, lobes, relations, blood supply, nerve supply and lymphatic drainage of prostate • Identify the parts of prostate most likely to be involved in benign and malignant growths of prostate • Justify the metastasis of carcinoma of prostate to vertebral column & cranial cavity on basis of venous drainage • Identify the gross features of ovaries and fallopian tubes on the given model • Describe the blood supply, nerve supply, lymphatic drainage of ovaries and fallopian tubes • Correlate the anatomy of female genital tract with hysterosalpingography, ligation of uterine tubes, ectopic tubal pregnancy • Describe the parts, ligaments, relations and support of uterus • Describe blood supply, nerve supply, & lymphatic drainage of uterus • Comprehend a case of uterine prolapse on the basis of gross anatomy of uterus with the help of given model • Identify the relation of uterine artery and ureter in the prosected specimen &		

			explain its clinical importance. • Illustrate sacral plexus showing its branches • Enlist the branches of internal iliac artery • Demonstrate the main arteries & veins of pelvis on the given model. • Enumerate different groups of lymph nodes of pelvis. • Explain the role of lymphatics and lymph nodes in spread of malignancies of pelvis		
40.	Gross Anatomy of Perineum	Apply the knowledge of anatomy of perineum, its parts and contents in appraising the relevant clinical scenarios in both males and females	• Define perineum. Identify its borders, relations & divisions in the given model. • Explain the boundaries of superficial and deep perineal pouches and enumerate their contents in both genders • Illustrate the cutaneous nerves of the perineum. • Define perineal body. Enlist structures attached with it. Justify its clinical importance • Describe the relations, internal features, blood supply, lymphatic drainage, & innervations of anal canal • Compare the gross features and presentation of external & internal hemorrhoids • Elucidate perianal hematoma, fissure, abscess and fistulas of anal canal with anatomical basis of their occurrence and presentation	SGD	MCQ SEQ SAQ OSPE Viva Voce

			• Describe the boundaries, contents & recesses of ischiorectal fossa • Justify the possible routes of spread of ischiorectal abscess with anatomical reasoning • Explain area of anesthesia, indications, &enlist steps of pudendal nerve block • Describe the gross features of vagina including relations, blood supply, nerve supply & supports • Apply the anatomical knowledge in analyzing a case of vaginal prolapse • Enlist the structures pierced during culdocentesis. • Explain gross features of all parts of male& female urethra, its arterial, venous drainage & nerve supply • Apply anatomical reasoning in justifying the route of extravasation of urine in case of injury to different parts of male urethra • Enlist parts of female external genitalia and describe their blood and nerve supply		
41.	Surface Anatomy	Utilize the knowledge of topography of contents of posterior abdominal wall in plotting the same on body surface and	• Mark the following on the surface of given subject: • Kidneys • Suprarenal glands • Ureter • Abdominal aorta Inferior vena cava	SGD	Viva Voce

		inferring relevant clinical presentations.			

ANATOMY (HISTOLOGY) PRACTICALS					
S.No	**Topic**	**Learning outcomes**	**Learning Objectives**	**MIT**	**Assessment Tool**
		By the end of this block, students should be able to:			
1.	Digestive System	Identify H&E stained slides of different components of digestive system and appreciate their characteristic histological features to distinguish them from common pathological conditions in future.	• Identify a slide of esophagus under a microscope • Draw a labeled a diagram showing its section on the journal • List two points of identification	Lab	OSPE Viva Voce
2.			• Identify a slide of stomach under light microscope • Draw a labeled diagram showing its section (fundus and pylorus) on the journal • List two points of identification	Lab	OSPE Viva Voce
3.			• Identify the slides of duodenum, jejunum and ileum under microscope. • List two points of identification of each. • Draw a labeled diagram of these structure in the journal	Lab	OSPE Viva Voce

4.			• Identify the slides of appendix, and colon under microscope • List two points of identification of each • Draw labeled diagrams showing the microscopic sections of colon and appendix in the journal	Lab	OSPE Viva Voce
5.			• Identify the slides of liver and gall bladder under microscope • List two points of identification of each • Draw labeled diagrams of liver and gall bladder in journal.	Lab	OSPE Viva Voce
6.			• Identify the section pancreas on given slides under microscope • List two points of identification. • Draw labeled diagram of histological structure of pancreas in journal	Lab	OSPE Viva Voce
7.	Urinary system	Identify H&E stained slides of different components of urinary system and appreciate their characteristic histological features to distinguish them from common Pathological conditions in future.	• Identify the histological features of kidney on a slide under microscope • Write two points of identification • Draw a labeled diagram of identified tissue in journal	Lab	OSPE Viva Voce

8.			• Identify the histological features of Ureter & Urinary bladder under microscope • Write two points of identification • Draw a labeled diagram of identified tissue on histology notebook	Lab	OSPE Viva Voce

ANATOMY CBLs:

CBL-I: Liver cirrhosis

A 54-year-old mechanic was admitted to hospital because of severe epigastric pain and repeated episodes of vomiting of blood (hematemesis). His blood pressure was 90/40mmHg and his pulse rate was 120/min. The patient revealed that he had exhibited upper gastrointestinal bleeding on previous occasions, but never so profusely. He was a patient of hepatitis C infection for the past 5 years.

On Examination, the patient's skin and conjunctivae were jaundiced. His abdomen was enlarged and rounded, with protuberant umbilicus. Several bluish, dilated varicose veins radiated from his umbilicus, forming caput medusae.

Palpation revealed that the liver measured 14 cm indicating hepatomegaly and his spleen was palpable 3 cm below the left costal margin (splenomegaly).

During a proctoscopic examination internal hemorrhoids were observed. The USG abdomen showed ascites and his liver was nodular, portal vein diameter was increased. The investigations confirmed the diagnosis of cirrhosis of liver.

Learning objectives:

- Describe the gross anatomy of liver regarding its lobes, surfaces, relations, ligaments peritoneal reflections, blood supply, nerve supply, lymphatic drainage and functions.
- Identify the impressions of surrounding structures of the liver on its visceral surface.
- Explain the intra hepatic and extra hepatic biliary apparatus.
- Describe the formation of portal vein. Enumerate its relations and tributaries.
- Describe the sites of porto-caval anastomosis with reference to the veins participating in each anastomosis.
- Describe portal hypertension. Justify its relation with cirrhosis of liver.

Reading References for CBL-1:

- Clinical Anatomy by regions, Richard S. Snell
- Moore Clinically Oriented Anatomy, Keith L. Moore
- Last's Anatomy

CBL-2: Carcinoma of rectum

A 65-years-old male came to surgeon with recurrent episodes of passing blood stained stools and altered bowel habits for the last 4 months. He also gave history of increased frequency of defecation but small amount of stool was passing every time. He lost 10kgs during this period. There was no family history of diabetes, hypertension or heart disease. He belonged to upper socioeconomic class. On general physical examination, his pulse was 90/min, B.P. was 110/65 mm Hg and temperature was 980F. Pallor was found to be positive. On per rectal examination, surgeon's finger was stained with coagulated blood. On sigmoidoscopy, a fungating mass was found 15 cm from anal verge. CT scan revealed a rectal mass with enlarged paracolic& para-aortic lymph nodes & two lesions were present in right lobe of liver.

Learning objectives:

- Diagnose the two cases by differentiating their symptoms, signs, & findings on examination and investigations.
- Describe relations, curvatures, blood supply, lymphatic drainage, & nerve supply.
- Correlate blood supply of rectum with the arrangement of internal hemorrhoids.
- Describe location, relations, blood supply, lymphatic drainage & innervations of anal canal
- Enlist clinical conditions related with rectum and anal canal, esp common in our population.
- Identify the features of the rectum that differentiate it from the colon.
- Explain the local and distant spread of carcinoma of rectum regarding its route, anterior, posterior and lateral penetration of the structures involved.
- Describe the development of anorectal canal.
- Classify the anorectal anomalies. Correlate these anomalies with normal development of hindgut.
- Enlist causes of bleeding per rectum.
- Describe the boundaries of ischiorectal fossa.
- Demonstrate History taking on a SP with lower GIT bleed.
- Demonstrate examination of a SP with lower GIT bleed.

Reading References for CBL-2:

- Clinical Anatomy by regions, Richard S. Snell • Moore Clinically Oriented Anatomy, Keith L. Moore
- Last's Anatomy.
- The Developing Human Clinically Oriented Embryology, Keith L Moore

CBL-3: Uterine prolapse& Professional Ethics

A 50-year-old woman visited the gynaecology OPD complaining of back pain, feeling of heaviness in pelvis and the sensation of something "coming down" her vagina, especially when she was standing. In addition, she was troubled by stress incontinence on coughing, sneezing, or lifting a heavy object. She also had need to micturate frequently during whole of the day. The patient has six children, all born by vaginal delivery and had prolonged labor in the last three deliveries. This was her second visit to the gynecologist in a year, for the same problem. She was advised pelvic floor exercises in the last visit which she did not carry out regularly and she feels

that her problems have aggravated. The general examination was unremarkable. Gynecological pelvic examination revealed a moderate downward bulging of the anterior vaginal wall that increased on straining. On examination while standing, the cervix of the uterus was found in the vagina, close to the vestibule. It recedes somewhat when the patient was supine but did not assume its normal position.

A diagnosis of 2nd degree uterine prolapse and cystocele was made. A vaginal hysterectomy and an anterior colporrhaphy were recommended. The patient asks you not to tell her husband and children.

Learning objectives:

- Define uterine prolapse, stress incontinence and cystocele.
- Describe the gross features of the uterus and vagina, along with the relations, blood supply, nerve supply and the lymphatic drainage.
- Demonstrate the peritoneal reflections of the pelvis and the uterus in the given model.
- Describe the ligaments and the supports of uterus.
- Describe the anatomy of the pelvic diaphragm. Enlist muscles forming it.
- Justify the significance of pelvic diaphragm.
- Enlist structures that can prolapse and cause buldge in the anterior and posterior wall of vagina.
- Understand the ethical dimensions of patient privacy. **Reading References for CBL-3:**
- Clinical Anatomy by regions, Richard S. Snell
- Moore Clinically Oriented Anatomy, Keith L. Moore
- Last's Anatomy
- Hand book of Behavioral sciences, Mowadat Rana - 3rd Edition.

CBL -4: Inguinal hernia & active listening.

A 45 years old male, smoker with chronic cough, presented to the hospital with a soft right scrotal swelling. On examination, mass was non tender & the attending physician was unable to get above the swelling. Testes were felt separate from the mass, transillumination test was negative and on standing cough impulse was positive. With careful maneuvering, the mass was massaged back into the inguinal canal, emptying the scrotum. Examination of the opposite site was unremarkable. A diagnosis of direct inguinal hernia was made, and he was scheduled for herniorrhaphy in the coming week. The patient is very upset and wants re-assurance that after surgery he will be cured.

Learning objectives:

- Justify the diagnosis of direct inguinal hernia in this case with anatomical reasoning.
- Differentiate between direct & indirect inguinal hernias regarding their relation with age, predisposing factor, frequency, coverings on exit from abdominal cavity, course, & exit from anterior abdominal wall
- Enumerate the structures passing through superficial & deep inguinal rings
- Mark the superficial & deep inguinal rings on the surface of given subject
- Describe the boundaries/ walls of inguinal canal
- Comprehend the functions & mechanics of inguinal canal • Define abdominal hernia. Describe different parts of a hernia.
- Enlist common types of abdominal hernia & describe the characteristics of each type
- Describe the structure of the anterior abdominal wall, its muscles, nerve supply, blood supply and lymphatic drainage.
- Define processus vaginalis and justify its relation to inguinal hernia.
- Justify the necessity for repairing a hernia.
- Identify the nerve which is susceptible to injury during the surgical repair of inguinal hernia and enlist the effects of injury to this nerve.
- Listen actively to the patients' problems.

Reading References for CBL-4:

- Clinical Anatomy by regions, Richard S. Snell
- Moore Clinically Oriented Anatomy, Keith L. Moore
- Last's Anatomy
- Hand book of Behavioral Sciences- 3rd Edition Mowadat Rana.

Second Professional MBBS Examination (2021)

ANATOMY

Table of Specifications for Annual 2nd Professional Examination:

Theory Time Allowed =03 hrs. (Including MCQs)

Marks of theory paper =80

Internal assessment =20

Total marks =100 Pass Marks =50

Paper-1 40 x MCQs (40 Marks) Time =50 min

Paper-2 Q. No. 1,2,3,4,5,6,7,8

4x SAQs/SEQs (Recall) = 05 marks each

4x SAQs/SEQs (Application) = 05 marks each

Total Marks = 40

Marks Time = 2 hours & 10 min

Sr No.	**Topic**	**NUMBER OF MCQs (40) Recall: 20 Application: 20 1 mark each**	**NUMBER OF SAQs/SEQs (08) 05 marks each**	
			Recall	application
1	Special Embryology	08		01
2	Special Histology	08	01	
3	Abdomen Pelvis & Perineum	09	01	01
4	Head and neck	09	01	01
5	Brain & Neuro Anatomy	08	01	01
Total		40 (40 Marks)	04 (20 Marks)	04 (20 Marks)
			08 (40 Marks)	

PS SEQ of application level each year can be given from upper limb, lower limb or thorax

*Clinical application of Anatomy(surgery) will be asked through application-level Questions

Theory: Internal Assessment (IA) Calculation (20 Marks)

Exam	Weightage	Exam	Percentage
End of Block & Pre-annual Exams	80%	End of Block Exam – I	20
		End of Block Exam – II	20
		End of Block Exam – III	20
		Pre-Annual Exam	20
Modular/ Class Performance	20%	Modular/ Class Tests	20
Total	100%		100

Table of Specifications for Annual Professional Exam: Practical

Sr no	Topic	Viva Marks	OSPE 38 Marks Gross, Embryo, Radiology 02 mark / Station Histology 1 mark /station		Histology Manual	Grand Total/ Component
			Station (unobserved) 26 Marks	Observed Stations 15 Marks		
1	Special embryology	**10**	01 (02 marks)			**12**
2	Special histology		10 (10 marks)	9 marks (long slides)	02 marks	21
3	Abdomen Pelvis & Perineum	10	02 (04 marks)	Surface Marking 1 mark		15
4	Head & Neck	10	02 (04 marks)	1 mark		15
5	Brain & Neuro Anatomy	10	02 (04 marks)			14
6	Radiology	10	01 (02 marks)	1 mark		3
	Total	**40 Marks**		**12 marks**	**02 marks**	**80 marks**

Practical: Internal Assessment Calculation (20 Marks)

Exam	Weightage	Exam	Percentage
End of Block Pre-Annual Exam	**80 %**	End of Block Exam – I	**20**
		End of Block Exam – II	**20**
		End of Block Exam - III	**20**
		Pre-Annual Exam	**20**
Portfolio / Logbook	**20%**	1) SGD/ CBL/ PBL 2) Projects 3) Presentations 4) Students' Reflections	**20**
Total	**100%**		**100%**

CBL/Assignments /Gross Sketch copies are part of Formative Assessment

*** SGD= Small Group Discussion CBL= Case Based Learning PBL= Problem Based Learning**

Physiology

GASTROINTESTINAL SYSTEM					
Sr No.	**Topic**	**Learning outcomes**	**Learning Objectives**	**MIT**	**Assessment Tool**
1.	Neural control of GIT	Analyze the interplay of autonomic and enteric nervous system in GI motility	• Appraise physiologic anatomy of gastrointestinal tract with specific focus on role of interstitial cells of Cajal • Compare functions of mesenteric and my enteric plexuses • Link the role of autonomic nervous system in GI motility	Lectures/SGD/ CBL	MCQ/ SAQ/ structured viva
2.	Food Processing in oral cavity	Correlate the Pathophysiology of Mastication and deglutition with specified clinical presentations	• Recognize the role of teeth, tongue, cheeks and saliva in assimilation and digestion of food. • Distinguish three phases of deglutition reflex • Outline different types of peristalsis in esophagus are taking place • Relate the clinical significance of esophageal sphincter with its physiological anatomy (achalasia gastria, GERD)	Lectures/SGD/ CBL	MCQ/ SAQ/ structured viva
3.	Gastric functions and emptying	Correlate physiological basis of gastric functions with specified clinical conditions.	• Enumerate functions of stomach • Analyze endocrinal role of stomach in digestion • Recognize interplay of mechanical and hormonal factors in regulation of stomach	Lectures/SGD/ CBL	MCQ/ SAQ/ structured viva

			emptying Explain the pathophysiology of gastritis, gastric atrophy, peptic ulcer and its management		
4.	Functions of small intestine	Categorize movements and functions of each part of small intestinal in detail	• Classify movements of small intestine • Elaborate neural and hormonal control • of small intestinal movements • Summarize role of small intestine in digestion	Lectures/SGD/ CBL	MCQ/ SAQ/ structured viva
5.	Functions of large intestine	Correlate physiology of colon with specified clinical conditions	• Categorize movements of large intestine with emphasis on haustrations • Enumerate functions of large intestine • Analyze role of secretions of large intestine in bulk movement • Emphasize the role of gastrocolic and duodenocolic reflexes in regulation of mass movements • Recognize the pathophysiological basis of diarrhea and megacolon	Lectures/SGD/ CBL	MCQ/ SAQ/ structured viva
6.	Defecation reflex	Explain the process of defecation	Compare and contrast Intrinsic and extrinsic pathways of defecation reflex	Lectures/SGD/ CBL	MCQ/ SAQ/ structured viva
7.	Vomiting reflex	Describe mechanism (stimuli, pathways, center) and clinical	• Explain the mechanism of vomiting reflex • Appraise the location and function of vomiting center/ chemoreceptor trigger	Lectures/SGD/ CBL	MCQ/ SAQ/ structured viva

		significance of vomiting reflex	• Zone in the brain		
8.	Liver and gall bladder	Relate digestive functions of liver and gall bladder with jaundice	• Elaborate Non metabolic functions of liver in detail • Explain role of liver in synthesis and secretion of bile • Explain role of gall bladder in fat digestion • Differentiate pathophysiology prehepatic, hepatic and pos hepatic jaundice.	Lectures/SGD/ CBL	MCQ/ SAQ/ structured viva

RENAL					
S.No	**Topic/ Theme**	**Learning outcomes**	**Learning Objectives / Course Content**	**MIT**	**Assessment Tool**
1.	Water balance	Relate pathophysiological basis of water balance in the body with its clinical implications (dehydration, vomiting, hemorrhage, SIADH)	• Identify distribution of total body water and ions in different body compartments • Appraise the basic principles of osmosis and osmotic pressure • Explain the effect of tonicity of solutions on cell physiology • Analyze Indictor dilution method	Lectures/ SGD/CBL	MCQ/SAQ/ structured viva
2.	Edema	Elucidate edema types, clinical significance and factors responsible for causing edema	• Analyze the role of starling forces and other safety factors (lymphatics , negative ISF pressure) in prevention of edema. • Differentiate between pitting and nonpitting edema based on its etiology, pathophysiology and clinical significance.	Lectures/ SGD/CBL	MCQ/SAQ/ structured viva
3.	Functional anatomy of kidney	Recognize functions of Kidneys.	• Outline the physiological anatomy of nephron and glomerular capillary membrane • List primary and endocrinal functions of kidney	Lectures/ SGD/CBL	MCQ/SAQ/ structured viva

4.	Urine formation	Analyze the process of urine formation, concentration and dilution.	• Relate the determinants of GFR to clinical conditions. • Identify the parameters involved in auto regulation of GFR and blood flow. • Distinguish role of different parts of nephron and key electrolytes (Na+, K+, Ca+ and PO4) in tubular reabsorption and secretion keeping in view the role of Glomerulotubular mechanism of reabsorption. • Explain factors regulating urine concentration • Appraise the role of vasa recta in maintaining hyperosmolarity of renal medulla • Recognize the role of ADH in urine dilution	Lectures/ SGD/CBL	MCQ/SAQ/ structured viva
5.	Plasma clearance	Correlate plasma clearance methods to quantify kidney functions	• Recognize the importance of estimation of GFR by inulin and creatinine clearance • Identify the importance of PAH for estimation of renal plasma flow.	Lectures/ SGD/CBL	MCQ/SAQ/ structured viva

6.	Renin angioten sin aldoster one system	Explain regulation of BP	• Analyze the role of renin angiotensin and aldosterone system in natriuresis and diuresis • Explain long term control of BP • Identify therapeutic role of diuretics and ACE inhibitors, Angiotensin-2 antagonists in regulation of BP	Lectures/ SGD/CBL	MCQ/SAQ/ structured viva
7.	Micturition reflex	Analyze the mechanical and Neural control of micturition process.	• Outline physiologic anatomy of urinary bladder • Correlate normal micturition reflex with its clinical abnormalities (atonic, automatic and neurogenic bladder)	Lectures/ SGD/CBL	MCQ/SAQ/ structured viva
8.	Acid base balance	Diagnose acid base disorders on clinical scenarios and arterial blood gas analysis	• Revisit reabsorption of H+ and HCO3 in kidneys and other body buffers • Analyze Interplay of respiratory and renal systems in regulation of acid base balance • Interpret arterial blood gas analysis in various acid base disorders	Lectures/ SGD/CBL	MCQ/SAQ/ structured viva

LIST OF PRACTICALS

1	Research
2	Calculate BMI & Waist Circumference
3	Recording Body Temperature (x 2 weeks)
4	General Physical Examination
5	New OSPE Format Practice
6	Estimate urine specific gravity on a given sample
7	Interpret Arterial Blood Gases report
8	Examination of sensory system

LIST OF CBLs

1	Research
2	Achalasia (I can't Swallow)
3	Peptic Ulcer (My stomach burns)
4	Cholera (Rice water stool)
5	Leadership
6	Acute/chronic renal failure (not passing urine)
7	Vomiting and diarrhea
8	Acid base balance (Fruity smell)

Second Professional MBBS Examination (2021)

PHYSIOLOGY

Table of Specifications for Annual First Professional Examination:

Theory Time Allowed = 03 hrs (Including MCQs)

Marks of theory paper = 80

Internal assessment = 20

Total marks = 100 Pass Marks = 50

45 x MCQs (40 Marks) **Time =50 min**

Q. No. 1,2,3,4,5,6,7,8

6 x SAQs/SEQs (Recall) = 05 marks each

2 x SAQs/SEQs (Application) = 05marks each

Total Marks = 40 Marks **Time = 2 hours & 10 min**

Sr No	Topic	Number of MCQs (40) Recall: 16 Application: 24 01 mark each		Number of SAQs/SEQs (08) 05 Marks each	
		Recall	Application	6x Recall	2 x Application
1	GIT+ Renal Physiology	04	06	01	Any 2 from whole course
2	Neurosciences	05	09	02	
3	Special Senses	03	05	01	
4	Endocrine + Reproduction	04	04	02	
	Total	**40 (40 Marks)**		**08 (40 Marks)**	

Theory: Internal Assessment (IA) Calculation (20 Marks)

Exam	Weightage	Exam	Percentage
End of Block Pre-Annual Exam	**80 %**	**End of Block Exam – I**	**20**
		End of Block Exam – II	**20**
		End of Block Exam - III	**20**
		Pre-Annual Exam	**20**
Modular Exam	**20%**	**Modular Tests**	**10**
		Assignments	**10**
Total	**100%**		**100%**

Table of Specifications for Annual Professional Exam: Practical

Viva (Theory) 40 marks		**Practical/ OSPE**			
Internal Examiner	External Examiner	OSPE (35)		Practical Journal	Total
		Observed	Unobserved		
20	20	25	10	05	**80**

***Number of observed stations are on the discretion of internal examiners but a minimum of three stations must be kept**

Example: - 1 Marks= 25 Maximum Stations = 5 Time per stations= 5 mins Total Time= 25 Minutes	Example: - 2 Marks =25 Stations = 3 Marks/ Stations= 8+8+9 Time / Stations= 8 Minutes

Practical: Internal Assessment Calculation (20 Marks)

Exam	Weightage	Exam	Percentage
End of Block Pre-Annual Exam	**80 %**	End of Block Exam – I	**20**
		End of Block Exam – II	**20**
		End of Block Exam - III	**20**
		Pre-Annual Exam	**20**
Portfolio / Logbook	**20%**	1) SGD/ CBL/ PBL 2) Projects 3) Presentations 4) Students' Reflections	**20**
Total	**100%**		**100%**

CBL/Assignments /Gross Sketch copies are part of Formative Assessment.

Biochemistry

Sr.No	Topic	Learning outcomes	Learning Objectives	MIT	Assessment Tool
		By the end of this block, students should be able to:		LGIS/ SGD/ CBL/ Practical / Tutorial	Theory/ OSCE/ Viva Voce
1.	Biochemistry of Digestive Tract	Understand the chemistry of Gastrointestinal secretions, digestion and absorption of Macromolecules and biochemical disorders of GIT.	Explain basic concepts of digestion and absorption	LGIS/ CBL	MCQ/ SEQ
2.		Understand the chemistry of Gastrointestinal secretions,	Describe composition, functions, daily secretion, stimulants and depressants of saliva, gastric juice and HCl	LGIS/ CBL	MCQ/ SEQ
3.			Elaborate composition, functions, daily secretion, stimulants and depressants of pancreatic juice, bile and intestinal juice	LGIS/ CBL	MCQ/ SEQ
4.		Understand the digestion and absorption of macromolecules and biochemical disorders of GIT.	Illustrate the digestion and absorption of carbohydrates, lipids, proteins and nucleic acids	LGIS/ CBL	MCQ/ SEQ
5.			Understand and elaborate the enzymes involved in above mentioned digestions and absorptions with specific actions, co-factors and metabolites those off	LGIS/ CBL/ Practical	MCQ/ SEQ

6.			Comprehend the biochemical disorders of GIT (achlorohydria, peptic ulcer, lactose intolerance, cholelithiasis) and underneath causes	LGIS/ CBL	MCQ/ SEQ
7.		Describe the names and role of GIT hormones in functioning of GIT.	Describe the hormones of GIT	LGIS/ CBL	MCQ/ SEQ
8.	Metabolism of Carbohydrates	Comprehend primary and secondary metabolism of Glucose	Describe Phases and reactions of Glycolysis	LGIS/ CBL	MCQ/ SEQ
9.			Comprehend Energetics of Aerobic and Anaerobic Glycolysis and their importance	LGIS/ CBL	MCQ/ SEQ
10.			Explain Regulation of Glycolysis	LGIS/ CBL	MCQ/ SEQ
11.			Illustrate Cori's cycle	LGIS/ CBL	MCQ/ SEQ
12.			Describe Fate of Pyruvate	LGIS/ CBL	MCQ/ SEQ
13.			Describe Reactions of TCA/Kreb's cycle	LGIS/ CBL	MCQ/ SEQ
14.			Explain Energetics, Regulation and importance of TCA cycle	LGIS/ CBL	MCQ/ SEQ
15.			Illustrate Amphibolic nature of TCA cycle	LGIS/ CBL	MCQ/ SEQ
16.			Describe Steps and three important bypass reactions of Gluconeogenesis	LGIS/ CBL	MCQ/ SEQ
17.			Comprehend Entrance of amino acids, intermediates of TCA cycle and other nutrients into Gluconeogenesis as glucogenic substrates	LGIS/ CBL	MCQ/ SEQ
18.			Describe Regulations and Significance of Gluconeogenesis	LGIS/ CBL	MCQ/ SEQ
19.			Explain Glycogen metabolism	LGIS/ CBL	MCQ/ SEQ
20.			Illustrate Reactions of Glycogenosis and	LGIS/ CBL	MCQ/ SEQ

			Glycogenesis		
21.			Describe Importance of UDP-Glucose	LGIS/ CBL	MCQ/ SEQ
22.			Describe Regulatory mechanism of Glycogen Synthase and Glycogen Phosphorylase	LGIS/ CBL	MCQ/ SEQ
23.			Describe Disorders of Glycogen metabolism	LGIS/ CBL	MCQ/ SEQ
24.			Explain Secondary Pathways of Carbohydrates (Hexose Monophosphate Pathway & Glucuronic acid Pathway)	LGIS/ CBL	MCQ/ SEQ
25.			Describe Reactions And Importance of Hexose Monophosphate Pathway and Glucuronic acid Pathway	LGIS/ CBL	MCQ/ SEQ
26.		Describe secondary metabolism of disaccharides and monosaccharide des other than Glucose	Comprehend Metabolism of fructose, galactose, mannose and disaccharides (Lactose) and their disorders	LGIS/ CBL	MCQ/ SEQ
27.		Illustrate regulation of blood glucose level and diabetes mellitus	Describe Normal Blood Glucose Level, Hyperglycemia, Hypoglycemia, and mechanisms involved in blood glucose regulation	LGIS/ CBL	MCQ/ SEQ / OSCE
28.			Correlate Diabetes mellitus- Its types, biochemistry, laboratory findings and diagnosis	LGIS/ CBL/ Practical	MCQ/ SEQ / OSCE
29.	Biochemistry of Water & Electrolyte s and Acid Base Balance	Understand biochemical significance of water, fluids homeostasis, electrolyte balance in human body	Illustrate Distribution of water in human body	LGIS/ CBL	MCQ/ SEQ
30.			Describe Functions of water in human body	LGIS/ CBL	MCQ/ SEQ
31.			Describe Regulation of water balance	LGIS/ CBL	MCQ/ SEQ

32.			Comprehend Role of kidneys in water and electrolyte balance	LGIS/ CBL	MCQ/ SEQ
33.			Describe Hypernatremia, hyponatremia, hyperkalemia, hypokalemia, magnesium	LGIS/ CBL/ Practical	MCQ/ SEQ
34.		Understand biochemical significance of	Explain Acid base balance	LGIS/ CBL	MCQ/ SEQ
35.		Acid Base homeostasis, in human body	Describe Mechanism of acid base regulation	LGIS/ CBL/ Practical	MCQ/ SEQ
36.			Illustrate Disorders of acid base balance	LGIS/ CBL/ Practical	MCQ/ SEQ

CBLs

CBL 1:

Topic: Biochemistry of Digestive Tract (Lactose Intolerance)

A 30 year old white man from British embassy reported with bloating, abdominal pain and diarrhea for 3 hours. He was a known patient of IBD and a careful history revealed ingestion of ice cream just before the onset of symptoms. Attending physician suspected lactose intolerance (not adult hypolactasia) and advised the patient lactose free diet after symptomatic management.

Related Lab Investigations:

Test Name	Result	Normal Values
Hydrogen breath	Hydrogen 30ppm after 1.5 hrs of ingestion of	Less than 20 ppm
Stool RE	Normal study	Normal study

Lactase is an intestinal brush border enzyme which hydrolyzes disaccharide lactose to glucose and galactose. Its expression is maximum in infants and gradually decreases with advancing life in most people of non- European ancestry. More than 70-90 percent people of Caucasians, Africans and

American ancestry exhibit a decline in lactase expression also called adult hypolactasia. More over some GIT diseases which affect mucosa like, IBD (Crohn's disease), short bowel syndrome, malnutrition, sprueetc may also lead to lactase deficiency. Ingested lactose is neither thus digested nor absorbed and passes to colon where bacterial fermentation of lactose produces gas and organic acids. Organic acids osmotically draw water and cause increased peristalsis, cramps and diarrhea. The treatment and prevention rely on lactose free diet.

Learning Objectives:

1. Digestion and absorption of carbohydrates
2. Lactose intolerance
3. Other diseases related to digestion and absorption of carbohydrates

CBL 2:

Topic: Pyruvate Kinase efficiency

A two year old girl was referred to hematologist after her pediatrician found her to be severely anemic with splenomegaly and jaundice. Her mother gave a possible history of "blood problem" in her family but did not know for sure. Her complete blood count revealed normal hemoglobin with normocytic anemia. The platelet and white cell count was normal. On the peripheral smear there were many bizarre erythrocytes including speculated cells. A diagnosis of Pyruvate Kinase deficiency was made.

Explanation

The normal erythrocyte lacks mitochondria and is completely dependent on glycolysis for production of ATP.ATP is required to meet the metabolic needs of the RBCs and to fuel the pumps necessary for the maintenance of the biconcave, flexible shape of the cell, which allows it to squeeze through narrow capillaries. The anemia observed in glycolytic enzyme deficiencies is a consequence of the reduced rate of glycolysis, leading to decreased ATP production. The resulting alterations in the red blood cell membrane lead to changes in the shape of the cell and, ultimately, to phagocytosis by the cells of the reticuloendothelial system, particularly macrophages of the spleen. The premature death and lysis of red blood cells results in hemolytic anemia.

Learning Objectives:

1. Reactions of Glycolysis
2. Reduction of Pyruvate to Lactate
3. Fates of pyruvate and hormonal regulation of glycolysis
4. Glucose Transporters

CBL 3:

Topic: Carbohydrate Metabolism (G6PD deficiency)

A23 year old boy was prescribed Septran (**sulphamethoxazole** and trimethoprim) and **paracetamol** for urinary tract **infection** and **fever** (10 hrs. history of symptoms). After two days the boy presented

again with subsiding initial symptoms but **lethargy fatigue, dyspnea and slight pallor**. His lab investigations are given in the table below. Doctor suspected **G6PD deficiency** which was confirmed by genetic analysis later.

Related Lab Investigations:

Test Name	Result	Normal Values
Hemoglobin	9 g/Dl	12 – 17 g/dL
RBCs	3.2 x 106	4.1 – 5.6 x 106/µL
PCV (hematocrit)	28	35-50 %
MCV	84	80-98 fL
MCH	28	27-34pg
MCHC	30	32-36g/dL
WBCs	13 x 103/µL	4-11 x 103/µL
Fluorescent spot test (Butler test)	Positive	Negative

Glucose 6-phosphate dehydrogenase (G6PD) deficiency is an inherited disease characterized by **hemolytic anemia** caused by the inability to detoxify oxidizing agents. G6PD deficiency is the most common disease-producing enzyme abnormality in humans. DiminishedG6PDactivity impairs the ability of the cell to form the **NADPH** that is essential for the maintenance of the **reduced glutathione pool**. These results in a decrease in the cellular **detoxification of free radicals and peroxides** formed within the cell. Glutathione also helps maintain the reduced states of sulfhydryl groups in proteins, including hemoglobin. Oxidation of those sulfhydryl groups leads to the formation of denatured proteins that form insoluble masses (called **Heinz bodies**) that attach to the red cell membranes.

Learning Objectives:

1. HMP shunt and its importance
2. Sources of NADPH
3. Uses of NADPH in body

CBL 4:

Topic: Cholera (Water & Electrolytes)

A 21-years-old female law student working in a developing country suddenly began to pass profuse watery stools almost continuously. She soon started to vomit. Her general condition declined abruptly, and she was rushed to the local village hospital. On admission, she was cyanotic, skin turgor was poor, blood pressure was 70/50 mmHg (normal 120/80 mm Hg), and her pulse was rapid and

weak. The doctor on duty diagnosed cholera, took a stool sample, and started treatment immediately. Patient was isolated and given normal saline with 20mmol/L K+ added (ringers lactate was not administered). Doxycycline 500mg every 6 hours was started and plenty of ORS was advised after initial IV fluids. The relatives were called for counseling. As cholera can become epidemic or pandemic, relatives were given following advice to follows and teach others.

1. Drink only boiled or treated water.
2. Cook well and eat hot.
3. Avoid shellfish.
4. Peel all vegetables and fruits.

Related Lab Investigations:

Test Name	Result	Normal Values
Stool Microscopy	Vibrio cholera seen	Nil
Stool culture	Yielded growth of Vibrio cholera	Nil/ normal flora
Serum electrolytes	Low Na+,K+, Cl- and HCO3-	Normal

Vibrio Cholera is a gram negative rod, comma shaped bacterium transmitted through faecal- oral route. Its incubation period is few hours to 5 days and it causes profuse watery stools, fever, vomiting and rapid dehydration which may cause death. One may lose up to 1L/hour water in stools. Heat killed vaccine is not that effective and is not required for international travel. Prevention of epidemic spread is important. The key to effective treatment and prevention of death is meticulous and timely water and electrolyte replacement.

Learning Objectives:

1. Mechanisms of water regulation
2. Mechanisms of electrolyte regulation
3. Disturbances in water and electrolyte regulation and their correction
4. Role of ORS in rehydration

CBL 5:

Topic: CO poisoning and Metabolic Acidosis (DKA)

A 50-year-old chowkidar of boy's high school was brought to emergency in semicomatose state at 6 am. He was a known diabetic for last 10 years and had similar episode two months back but that time he was conscious and walked in himself. His capillary sugar level was high, blood pressure was

100/70mmHg, pulse 100 /min and respiratory rate was 30/min. He was moderately dehydrated, no other significant finding was there and laboratory investigations revealed following.

Related Lab Investigations:

As the compensation of the primary acidosis was not appropriate so he was diagnosed as a case of mixed acid base disorder (Metabolic acidosis and respiratory acidosis). A careful history revealed that he used a stove for heating in the room which used wood fire. This lead the physician to suspect CO poisoning as well. CO inhibits ETC and hampers ATP synthesis moreover it reduces the availability of active Hb for normal tissue oxygenation and CO2 removal. The treatment included oxygen support, HCO3 administration slow iv, sc insulin for hyperglycemia and iv fluids.

Test	Result	Normal Values
Plasma**N** Gl**amu**e**c** ose levels	16mmol/L	Max 11.1 random
pH	7.30	7.35 to 7.45
HCO	16	24
pC3O	35	mE40q/ L
Ketone bo2d ies in urine	Positive	NmmHgegativ

Learning Objectives:

1. How to diagnose acid base disorders
2. ETC and oxidative phosphorylation
3. Inhibitors of ETC and Oxidative phosphorylation including CO

Primary Disorder	**Change**	**Compensation**
Metabolic acidosis	↓ HCO3 1	↓ 1.3 CO2
Metabolic alkalosis	↑ HCO3 1	↑ 0.7 CO2
Respiratory acidosis		
Acute	↑ pCO2 10	↑ 1 HCO3
Chronic	↑ pCO2 10	↑ 3.5 HCO3
Respiratory alkalosis		
Acute	↓ pCO2 10	↓ 2 HCO3
Chronic	↓ pCO2 10	↓ 5 HCO3

Practicals

S.No	Topic	Learning outcomes	Learning Objectives	MIT	Assessment Tool
		By the end of this block, students should be able to:		LGIS/ SGD/ CBL/ Practical/ Tutorial	Theory/ OSCE/ Viva Voce
1.	Spectrophoto metry	Comprehend the Principles and Usage of Spectrophoto meter.	Differentiate between Visual Spectrophoto meter and UV-spectrophoto meter	Demonstra tion/ Practical	OSPE/ OSCE/ Practical Performance
2.			Identify different parts of Spectrophoto meter		OSPE/ OSCE/ Practical Performance
3.			Perform spectrophoto metery by applying its working principle to quantify the analysis of different enzymes or metabolites		OSPE/ OSCE/ Practical Performance
4.	Estimation and Clinical Interpretation of plasma enzyme ALP	Estimate the levels of Glucose, ALP, Creatinine, Creatinine Kinase in Serum Samples.	Estimate exact concentration of ALP in a given sample of plasma	Demonstra tion/ Practical	OSPE/ OSCE/ Practical Performance
5.			Comprehend the principle, and clinical use of the test of estimation of ALP, with the knowledge of reference range	Demonstra tion/ Practical	OSPE/ OSCE/ Practical Performance
6.	Estimation and Clinical Interpretation of Serum Glucose		Explain the causes of hypo and hyper glycemia	Demonstra tion/ Practical	OSPE/ OSCE/ Practical Performance
7.			Differentiate between random blood sugar and fasting blood sugar and its clinical correlation	Demonstra tion/ Practical	OSPE/ OSCE/ Practical Performance
8.			Comprehend the principle of the test for estimation of glucose	Demonstra tion/ Practical	OSPE/ OSCE/ Practical Performance
9.	Oral Glucose Tolerance Test and its		Interpret the principle, significance, and method of Oral Glucose	Demonstra tion/ Practical	OSPE/ OSCE/

	Clinical Interpretation		Tolerance Test		Practical Performance
10.	Estimation and Clinical Interpretation of Serum Cretinine		Estimate and clinically interpret the Creatinine is Serum sample	Demonstration/ Practical	OSPE/ OSCE/ Practical Performance
11.	Estimation and Clinical Interpretation of Serum Creatinine Kinase		Estimate and clinically interpret the Creatinine Kinase is Serum sample	Demonstration/ Practical	OSPE/ OSCE/ Practical Performance
12.	The techniques and instrumentation of pH Meter	Comprehend the Principles and Usage of pH Meter.	Identify the parts of pH meter	Demonstration/ Practical	OSPE/ OSCE/ Practical Performance
13.	The techniques and instrumentation of pH Meter		Comprehend the principle and usage of pH meter	Demonstration/ Practical	OSPE/ OSCE/ Practical Performance
14.	Estimation and Clinical Interpretation of Electrolytes in blood	Comprehend the Principles and Usage of Flame Photometer.	Identify the parts of Flame Photometer	Demonstration/ Practical	OSPE/ OSCE/ Practical Performance
15.			Comprehend the principle and usage of Flame Photometer	Demonstration/ Practical	OSPE/ OSCE/ Practical Performance
16.			Estimate the Electrolytes Sodium, Potassium, ands Chloride by Flame Photometer	Demonstration/ Practical	OSPE/ OSCE/ Practical Performance

Second Professional MBBS Examination (2021)

Bio chemistry

Table of Specifications for Annual First Professional Examination:

Theory Time Allowed = 03 hrs (Including MCQs)

Marks of theory paper = 80

Internal assessment = 20

Total marks = 100 Pass Marks = 50

40 x MCQs (on separate sheet) (40 Marks) **Time =50 min**

Q. No. 1,2,3,4,5,6,7,8,9

7x SAQs/SEQs (Recall) = 04 marks each

2x SAQs/SEQs (Application) = 06 marks each

Total Marks =40 Marks **Time = 2 hours & 10 min**

TOPIC	**NUMBER OF MCQs (40)** Recall (17) Application(23)	**7 x SAQ/SEQs (Recall) 04 marks each**	**2 x SAQ/SEQs (Application) 06 marks each**
Biochemistry of Digestive Tract + Nutrition	08	1.5	
Chemistry of Carbohydrates + Metabolism of Carbohydrates	08	1.5	
Biochemistry of Endocrine System + Neurotransmitters	06	01	
Biochemical Genetics + Molecular Biology Techniques	06	01	
Bioenergetics & Biological Oxidation+ Integration of metabolism + Xenobiotic+ Cancer Metabolism	06	01	
Nucleotide Chemistry + Nucleotide Metabolism + Body Fluids + Water & Electrolyte, Acid Base Balance	06	01	02 x whole course
		28	12
Total	**40 (40 Marks)**	**09 (40 Marks)**	

Theory: Internal Assessment (IA) Calculation (20 Marks)

Exam	Weightage	Exam	Percentage
End of Block Pre-Annual Exam	**80 %**	**End of Block Exam – I**	**20**
		End of Block Exam – II	**20**
		End of Block Exam - III	**20**
		Pre-Annual Exam	**20**
Modular Exam	**20%**	**Modular Tests**	**10**
		Assignments	**10**
Total	**100%**		**100%**

Table of Specifications for Annual Professional Exam: Practical

Viva (Theory) 40 marks		**Practical/ OSPE 40 marks**				
Internal Examiner	External Examiner	OSPE (20)		Viva performance	journal	Total
		Observed (2 station)	Unobserved (10 ststion)			
20	20	10	10	15	05	**80**

Practical: Internal Assessment Calculation (20 Marks)

Exam	Weightage	Exam	Percentage
End of Block Pre-Annual Exam	**80 %**	End of Block Exam – I	**20**
		End of Block Exam – II	**20**
		End of Block Exam - III	**20**
		Pre-Annual Exam	**20**
Portfolio / Logbook	**20%**	1) SGD/ CBL/ PBL 2) Projects 3) Presentations 4) Students' Reflections	**20**
Total	**100%**		**100%**

CBL/Assignments /Gross Sketch copies are part of Formative Assessment.

Medicine

S.No	Topic/ Theme	Learning outcomes	Learning Objectives/ Content	Instructional strategies	Assessment Tool
1.	Peptic Ulcer	Correlate the Relevant basic knowledge with clinical presentations	• Enumerate the causes of peptic ulcer • Justify the clinical presentation of peptic ulcer with reasoning • Discuss the treatment options of the disease		
2.	Malabsorption Syndromes		• Demonstrate Understanding of basic concepts		
3.	Nephrotic Syndrome				
4.	Acute & chronic RenalFailure		• Justify the clinical presentation with reasoning • Discuss the treatment options of the disease		

Surgery

S.No	Topic	Learning outcomes	Learning Objectives	MIT	Assessment Tool
		By the end of this block, students should be able to:			
1.	Abdominal Incisions	Apply the anatomical knowledge in deciding about the preferred route of approaching abdominal cavity in different scenarios in practice	• Demonstrate abdominal wall quadrants on a simulated patient • List common abdominal wall incisions and their indications List advantages and disadvantages of common abdominal wall incisions • Enlist the structures encountered sequentially by penetrating the abdominal wall just medial to, in front of, and lateral to the rectus sheath	LGIS	MCQ SEQ SAQ Viva Voce
2.	Abdominal hernias	Correlate the anatomical knowledge of abdominal wall in differentiating between various types of abdominal hernias	• Define hernia • Describe various parts of hernia • Enumerate different types of hernia • Differentiate between clinical presentation of direct and indirect inguinal hernia • Differentiate between clinical presentation of inguinal and femoral hernia	LGIS	MCQ SEQ SAQ Viva Voce
3.	Cholecystitis and cholelithiasis	Apply the anatomical knowledge in formulating the differential diagnosis of abdominal pain	• Define Cholecystitis and cholelithiasis • Discuss the typical clinical presentation of cholecystitis and cholelithiasis	LGIS	MCQ SEQ SAQ Viva Voce

			• Explain the referred pain of biliary colic with anatomical reasoning		
4.	Acute appendicitis and diverticulitis		• Define acute appendicitis • Define diverticulitis Describe embryological basis of diverticulitis • List complications of acute appendicitis	LGIS	MCQ SEQ SAQ Viva Voce
5.	Ureteric colic		• Identify the typical clinical presentation of urological colic • List risk factors for the most common types of kidney stones • Explain the rationale behind referred pain of ureteric colic • List common sites of impaction of renal stone	LGIS	MCQ SEQ SAQ Viva Voce
RADIOLOGY					
6.	Imaging of Abdomen and pelvis	Correlate the anatomical knowledge of abdomen, pelvis and perineum with relevant radiological presentation	• Identify important bony land marks on plain X ray abdomen and pelvis • Identify gas under diaphragm and multiple air fluid levels on radiographs • Identify normal appearance of GIT on plain radiographs and after barium meal and barium enema • Differentiate between normal and abnormal esophageal contrast study • Identify different parts of urinary tract on IVP • Identify normal appearance of viscera of pelvis on radiographs	LGIS	MCQ OSPE Viva Voce

Behavioral Sciences

S.No	Topic	Learning outcomes	Learning Objectives	MIT	Assessment Tool
1.	Introduction to Behavioral Sciences (teaching & assessment formats)	To inform students about the BSP module at WMC	• Interpret the importance of learning Behavioral Sciences • Understand the teaching and formative assessment formats for BSP	LGIS	Formative
2.	What is professionalism & its attributes in a doctor's life	Develop the appreciation of transitioning to the medical profession	Define professionalism for a doctor and summarize its main attributes	LGIS	Formative
3.	Ethics for medical students: an introduction	Discuss the ethical boundaries of conduct	Explain the importance of ethics in a medical students life	LGIS	Formative
4.	Leadership & its roles	Discuss the role of leadership in daily life	Enlist the various types of leadership	LGIS	Formative

Learning Resources

Anatomy

a) Clinical Anatomy for Medical Students by Richard Snell (9th edition).
b) Basic Histology Text and Atlas by Luiz Carlos and Junqueira (14th edition)
c) Basic Histology by Laiq Hussain Siddiqui (5th Revised edition)
d) Medical Embryology by Langman (14th edition).
e) Essential Clinical Anatomy by Keith Moore (7th edition).
f) The Developing Human by Keith Moore (10th edition).
g) General Anatomy by Laiq Hussain Siddiqui.

PHYSIOLOGY

a) Guyton and Hall Textbook of Medical Physiology, 13th Edition by John E. Hall.
b) Human Physiology: From Cells to Systems, 9th Edition by Lauralee Sherwood.
c) Ganong's Review of Medical Physiology, 25th Edition (LANGE Basic Science) by Kim E. Barrett, Susan M. Barman, Scott Boitano, Heddwen Brooks.
d) Practical physiology by CL Ghai
e) Electronic modes

BIOCHEMISTRY

a) Lippincott's illustrated reviews, 7th edition
b) Harper's illustrated Biochemistry, 30th edition
c) M.N Chatterjea Textbook of Biochemistry , 8th edition
d) M.D Vasudevan, Sreekumari, M.D.S;Kannan, M.D. Vaidyanathan D.M Textbook of Biochemistry for medical students, 2016
e) Practical Biochemistry Manual (Prof Maj Gen AK Naveed, Dr Shakir Khan)
f) Electronic modes

Feedback on the study guide

We value your feedback and will use it for improvement of this Study guide.

Kindly provide feedback for this study guide. At the email: dme@ckmc.edu.pk

References:

HARDEN, J.M. LAIDLAW, E.A. HESKETH, R. M. (1999). AMEE Medical Education Guide No 16: Study guides-their use and preparation. *Medical Teacher*, *21*(3), 248–265. https://doi.org/10.1080/01421599979491