



MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

Grade 'A' Accredited by NAAC

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COMPETENCY BASED MEDICAL EDUCATION (CBME)

(with effect from 2019-2020 Batches)

Curriculum for First M.B.B.S Human Anatomy

Amended upto AC-46/2023, Dated 28/04/2023

Amended History

1. Approved as per BOM 57/2019, [Resolution no. 3.1.1.13], Dated 26/04/2019.
2. Amended upto BOM 62/2020, [Resolution No 3.2.1.3.i], Dated 16/09/2020.
3. Amended upto BOM 63/2021, [Resolution No. 4.4.1.6], Dated 17/02/2021.
4. Amended upto AC-41/2021, [Resolution No. 4.1], [Resolution No. 4.3], [Resolution No. 4.4], [Resolution No. 4.8], [Resolution No. 4.9], [Resolution No. 4.10]; Dated 27/08/2021
5. Amended upto AC-42/2022, [Resolution No. 3.4], [Resolution No. 3.6],[Resolution No. 3.19]; dated 26/04/2022 (Incorporated at the end of syllabus).
6. Amended upto AC-46/2023, [Resolution No. 5.2], Dated 28/04/203.

MGM INSTITUTE OF HEALTH SCIENCES, NAVI MUMBAI

GRADUATE ATTRIBUTES

A student graduating from MGM Institute of Health Sciences, Navi Mumbai, should attain the following attributes:

- 1** • Dynamic professionalism
- 2** • Exemplary leadership
- 3** • Effective communication skills
- 4** • Scholarly attitude
- 5** • Element of critical thinking
- 6** • Enthusiasm for research
- 7** • Social commitment
- 8** • Global competencies

Dynamic professionalism:

Abide by professional codes of conduct, demonstrate high personal standards of behaviour, be considerate, trustworthy and honest, act with integrity. Apply effective strategies to maintain their own physical, psychological, social and spiritual well-being. Should be able to apply profession-specific knowledge, clinical skills and professional attitudes in implementation of evidence-based protocols for optimal outcome.

Exemplary leadership:

Focuses on the qualities required to effectively manage a career, as a practitioner or academician, work effectively within a system aiming at quality improvement, fostering a spirit of team-building.

Effective communication skills:

Communicates effectively and humanely with all stakeholders, their families, colleagues, through a variety of means, gathers and conveys information respectfully, in a culturally acceptable and dignified manner.

Scholarly attitude:

Demonstrates a lifelong commitment to reflective learning, strives to maintain professional competence. Committed to learn, disseminate, apply and translate knowledge

Element of critical thinking:

Will develop a habit of inquiry, use the knowledge gained for dealing with complex situations foster an ambience conducive for effective learning with constructive criticism, exercise critical judgement in evaluating sources of information.

Enthusiasm for research:

Develop intellectual curiosity and embark upon opportunities to develop research capabilities. Imbibe the basic principles of research methodology and engage in ethical research.

Social commitment:

Inculcate values of self-awareness, empathy, mutual respect. Understand our obligation to society and foster an ability to work in a diverse cultural setting. Understand how one's actions can enhance the well-being of others.

Global competencies:

Team-building, communication, self-management, collaborative working, openness and respect for a range of perspectives.

Annexure – C – I

MGM Institute of Health Sciences, Navi Mumbai

MGM Medical College

1st year MBBS. CBME

Human Anatomy Syllabus

(As per MCI CBME Curriculum)

Subject – Human Anatomy

Total Subject hours – 675 + 30 hours of Early Clinical Exposure + 12 hours of AETCOM

1. **Lectures** – 220 hours
2. **SGT / Tutorial / Practical (Dissection, Demonstration, Histology, Embryology - 415 hours**
3. **SDL** – 40 hours

Sr. No.	Topic	Hours	
1	Theory		220
2	Practical		415
	• Dissection	245	
	• Demonstration	70	
	• Histology	62	
	• Embryology	23	
	• Radiology + Surface & living anatomy	15	
3	SDL		40
4	ECE		30
5	AETCOM		12
Total			717 (675+30+12)

SR. NO.	TOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
	I - GENERAL ANATOMY		AN1- AN7
	CORE/ Y		
1	Introduction	Introduction to Anatomy & Terminology	AN1.1,2
2	Bone & Cartilage	Definition, Parts of a long bone, blood supply of long bone, various Classifications , types - structure, subtypes and examples,	AN2.1,4
		Epiphysis and its types,	
		Cartilage - definition, types, examples	
3	Joints	Classification, Fibrous joints, cartilaginous joints, Synovial joints – definition, Classification, stucture and examples, applied anatomy	AN2.5,6
		Synovial joints - nerve supply, Hilton's law,	
		Close packed and loose packed joints, range of movements,	
4	Muscle	Definition, Classification – functional and morphological, Origin, Insertion, Tendon, ligaments, Bursae.	AN3.1,2
5	Skin & fascia	Structure and Functions of Skin, Superficial fascia, deep fascia, modifications of deep fascia	AN4.2,3,4
6	Circulatory System	Types of circulation and its importance, classification of vessels (anatomical and physiological),	AN5.1,2,3,4,5,6
		Structure of blood vessels,	
		Factors affecting venous return, anastomosis, end arteries,	
		pulmonary and systemic circulation, define portal circulation with examples	
8	Nervous System	Classification – Central Nervous System(CNS), Peripheral nervous system (PNS) and autonomic nervous system (ANS),	AN7.1,2,3,4,6
		PNS – Cranial Nerves, Spinal Nerves, Typical Spinal Nerve, Myelination & Dermatomes, concept of muscle paralysis	
		Classification of neurons, Nerve fibres & Glial cells,	

SR. NO.	TOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
	I - GENERAL ANATOMY		AN1- AN7
	NON CORE/ N		
1	Bone	Enumerate special features of a sesamoid bone, ossification and its classification, Laws of ossification.	AN2.2,3
2	Muscles	Spin, swing components of movements, types of levers, Explain Shunt and spurt muscles, Bursitis Kinesiology, Describe principles of sensory and motor innervation of muscles	AN3.3
3	Skin & fascia	Describe different types of skin & dermatomes in body, Langer's lines, Flexure creases, Explain principles of skin incisions, Dermatoglyphics, Skin graft	AN4.1,5
4	Circulatory System	Explain function of meta-arterioles, precapillary sphincters, arterio-venous anastomoses, Define atherosclerosis, thrombosis, infarction & aneurysm	AN5.7,8
5	Lymphatic System	Lymphatic circulation, circulating lymphocytes, lymphoid tissue, functions, lymphoedema, tumours	AN6.1,2,3
6	Nervous System	Describe various type of synapse, Describe differences between sympathetic and spinal ganglia	AN7.5,7,8

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
II UPPER LIMB			AN8- AN13
CORE/ Y			
1	Bones	Clavicle, Scapula, Humerus, Radius, Ulna, Articulated hand, Supracondylar fracture, fracture neck humerus, Colles fracture, peculiarities of clavicle and pisiform	AN8.1,2,3,4,5
2	Pectoral region,	Mammary gland - location, extent, deep relations, structure, age changes, blood supply, lymphatic drainage, microanatomy and applied anatomy Muscle Attachments, Nerve Supply, actions of pectoralis major, minor	AN9.1,2
3	Axilla, Scapular & shoulder region	axilla - boundaries, contents, applied anatomy Brachial plexus, Axillary artery, vein & lymph nodes, Muscle Attachments, Nerve Supply, actions of deltoid, serratus anterior, Winging of scapula, Trapezius, latissimus dorsi, rotator cuff,	AN10.1,2,3,4,5,8, 9,10,11
4	Arm, Cubital fossa	Muscle Attachments, Nerve Supply, actions of muscles of arm (esp.- biceps, triceps), Axillary nerve, Musculocutaneous nerve, brachial artery, fascial compartments of upper limb, cubital fossa - boundaries, contents, applied anatomy, Venepuncture of cubital veins	AN11.1,2,3,4,5
5	Forearm, hand	Muscle Attachments, Nerve Supply, actions of muscles of forearm - flexors & extensors (esp. brachioradialis, pronator teres), intrinsic muscles of palm (groups, esp. lumbricals, interossei), Nerves - , Radial Nerve, Median nerve, Ulnar nerve, Radial and ulnar arteries, superficial and deep palmar arches, Venous and lymphatic drainage of upper limb, retinacula, fibrous flexor sheaths, ulnar bursa, radial bursa and digital synovial sheaths, extensor expansion formation, Applied – , Tennis elbow, Wrist drop, claw hand, Dupuytren’s contracture, carpal tunnel syndrome, Anatomical snuff box.	AN12.1,2,3,4,5,6, 7,8,9,11,12,13,14, 15 AN13.1

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
II UPPER LIMB			AN8- AN13
CORE/ Y			
6	Joints	shoulder girdle & shoulder joint, elbow joint, wrist joint, Superior and inferior radioulnar joints, 1st carpometacarpal joint. - type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy	AN10.12 AN13.3
NON CORE/ N			
1	Bones	scaphoid fracture	AN8.6
2	Applied	anatomical basis of clinical features of Injury to axillary nerve, infection of fascial spaces of palm, enlarged axillary lymph nodes	AN10.7,13, AN12.10
3	Anastomoses	Arterial anastomosis around the scapula & elbow joint and mention the boundaries of triangle of auscultation	AN10.9, AN11.6
4	Dermatomes	Dermatomes of upper limb	AN13.2
5	Joints	Sternoclavicular joint, Acromioclavicular joint, Carpometacarpal joints & Metacarpophalangeal joint	AN13.4

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
III LOWER LIMB			AN14- AN20
CORE/ Y			
1	Bones	Hip bone, Femur, Tibia, Fibula, Patella, articulated foot, (esp. talus and calcaneum) importance of ossification of lower end of femur & upper end of tibia, blood supply of head of femur	AN14.1,2,3
2	Front & medial side of thigh	<p>Muscles – Attachments, nerve supply and actions of muscles of front & medial side of thigh (esp. quadriceps femoris, sartorius, adductor longus, magnus)</p> <p>Nerves - Femoral nerve, Obturator nerve, Vessels – Femoral artery</p> <p>Boundaries, contents, applied anatomy of - femoral triangle with femoral sheath & adductor canal</p>	AN15.1,2,3,5
3	Gluteal region, back of thigh,	<p>Muscles – Attachments, nerve supply and actions of muscles of Gluteal region (Glutei), back of thigh with anatomical basis of sciatic nerve injury during gluteal intramuscular injections and Trendelenburg sign</p> <p>Nerves – Sciatic nerve, vessels - crurial and trochanteric anastomosis, popliteal artery</p> <p>Boundaries, contents, applied anatomy of - popliteal fossa</p>	AN16.1,2,3,4,5,6
4	Anterolateral compartment of leg & dorsum of foot	<p>Muscles – Attachments, nerve supply and actions of Anterolateral compartment of leg (esp. tibialis anterior)</p> <p>Nerve - common peroneal nerve with anatomical basis of foot drop, vessels - anterior tibial and dorsalis pedis artery</p>	AN18.1,2,3
5	Back of Leg & Sole	<p>Muscles – Attachments, nerve supply and actions of muscles of Back of Leg (esp. triceps surae with concept of Peripheral heart, tibialis posterior) & Sole, layers (names of muscles)</p> <p>Nerve - tibial nerve, vessels - posterior tibial, and medial and lateral plantar nerves and vessels</p>	AN19.1,2,3

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
III LOWER LIMB			AN14- AN20
CORE/ Y			
6	General Features	Fascia lata, Retinacula & Dermatomes of lower limb	AN20.3,5
		Venous drainage of lower limb with applied anatomy (esp. anatomical basis of varicose veins and deep vein thrombosis)	
		Lymphatic drainage,	
7	Joints	Hip joint, knee joint, tibiofibular, ankle joint - type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy (esp. Trendelenburg sign,)	AN17.1, AN18.4,5, AN19.5, AN 20.1
		arches of foot - formation, functions, maintaining factors and applied anatomy	
NONCORE/ N			
1	Bones	Various bones in the articulated foot with individual muscle attachment	AN14.4
2	Applied	Anatomical basis of Psoas abscess & Femoral hernia, complications of fracture neck of femur, dislocation of hip joint and surgical hip replacement, knee joint injuries, Osteoarthritis, rupture of calcaneal tendon, Flat foot & Club foot, Metatarsalgia & Plantar fasciitis, enlarged inguinal lymph nodes	AN15.4, AN17.2,3, AN18.6,7, AN19.4,6,7, AN20.4
3	Joints	Subtalar and transverse tarsal joints - type, articular surfaces, ligaments, movements, muscles involved, nerve supply and applied anatomy	AN20.2

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
IV THORAX			AN21- AN24
CORE/ Y			
1	Thoracic cage	Bones – Ribs, sternum, Thoracic vertebrae	AN21.1,3,4,5,6,8,9
		Joints of Thorax - type, articular surfaces & movements of manubriosternal, costovertebral, costotransverse and xiphisternal joints	
		Thoracic cage – Inlet, cavity, outlet	
		intercostal spaces - types, boundaries, contents with vessels, nerves with its clinical importance,	
		mechanism of respiration - types, movements, muscles, applied anatomy	
2	Heart & Pericardium	Pericardium - subdivisions, sinuses, blood supply, nerve supply and applied aspect	AN22.1-7
		heart - features, blood supply, fibrous skeleton, conducting system, applied anatomy	
3	Mediastinum	Mediastinum – Divisions, boundaries and contents	AN23.1,2,3,4,5,7
		Oesophagus - features, relations, blood supply, nerve supply, lymphatic drainage and applied anatomy	
		Thoracic duct - extent, relations, tributaries, applied anatomy	
		Superior vena cava, azygos venous system - origin, course, relations, tributaries, termination and applied anatomy	
		Aorta - extent, branches, relations and applied anatomy	
		Thoracic sympathetic chain	
4	Lungs & Trachea	Pleura - extent, recesses, blood supply, lymphatic drainage, nerve supply, applied anatomy	AN24.1-5
		Lung - features, relations, Bronchopulmonary segments, blood supply, lymphatic drainage, nerve supply, applied anatomy	
		Phrenic nerve - formation & distribution	

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
IV THORAX			AN21- AN24
NON CORE/ N			
1	Thoracic cage	Features of 2 nd , 11 th and 12 th ribs, 1 st , 11 th and 12 th thoracic vertebrae	AN21.2
		Origin, course, relations and branches of 1) atypical intercostal nerve 2) superior intercostal artery, subcostal artery	AN21.7
		Costochondral and interchondral joints	AN21.10
2	Mediastinum	Splanchnic nerves	AN23.6
3	Lungs & Trachea	Extent, length, relations, blood supply, lymphatic drainage and nerve supply of trachea	AN24.6
V HEAD, FACE, NECK			AN26- AN43
CORE/ Y			
1	Osteology	skull – parts, bones, Normas-verticalis, occipitalis, Frontalis, lateralis, basalis, interior of skull, Mandible, Cervical vertebrae, fetal skull	AN26.1-5
2	Scalp	layers, blood supply, nerve supply and surgical importance	AN27.1,2
3	Face & parotid region	Muscles of facial expression with nerve supply	AN28.1-9
		Facial vessels - course, branches with applied aspect	
		Nerve supply of face - sensory, motor - with course and distribution, applied anatomy of VII nerve	
		lymphatic drainage of HFN - cervical lymph nodes with applied anatomy	
		parotid gland - features, relations, nerve supply, duct and surgical importance	
4	Neck	Anterior & posterior triangles of neck – Boundaries, subdivisions, contents, applied aspect, Midline structure of neck,	AN29.1,2 AN32.1,2 AN35.1-7
		Muscle Attachments, Nerve Supply, actions of Sternocleidomastoid, digastric, omohyoid, stylohyoid, mylohyoid	

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
V HEAD, FACE, NECK			AN26- AN43
CORE/ Y			
4	Neck	deep cervical fascia - parts, extent, attachments, modifications, spaces, applied anatomy	AN29.1,2 AN32.1,2 AN35.1-7
		thyroid gland - location, parts, borders, surfaces, relations, blood supply and applied anatomy	
		Vessels - origin, course, relations, branches/ tributaries and termination of Carotid arteries, subclavian artery, internal, external jugular, brachiocephalic veins	
		Nerves - course and distribution of IX, X, XI & XII nerves, cervical sympathetic chain	
5	Cranial cavity, Orbit	dural folds - attachments and contents, dural venous sinuses - classification, location, communications, tributaries and applied of sagittal, cavernous sinuses	AN30.1-4 AN31.1,2,4,5
		Extraocular - Muscles Attachments, Nerve Supply, actions, applied anatomy	
		Vessels - origin, branches/ tributaries and termination of ophthalmic vessels	
		Nerves - course and distribution of III,IV,VI nerves & ciliary ganglion - roots, branches	
5	Cranial cavity, Orbit	Pituitary gland - location, parts, relations, blood supply and applied anatomy	AN30.1-4 AN31.1,2,4,5
		Lacrimal apparatus	
6	Temporal, Infra-temporal & sub-mandibular regions	Temporal and infratemporal fossae - extent, boundaries and contents	AN33.1-4 AN34.1
		Muscles of mastication - Attachments, Nerve Supply, actions, applied anatomy	
		Temporo-mandibular joint - type, articular surfaces, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy	
		Nerves - course and distribution, applied anatomy of V3 nerve with otic, submandibular & Pteriogopalatine ganglia - roots, branches, applied anatomy	

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
V HEAD, FACE, NECK			AN26- AN43
CORE/ Y			
6	Temporal, Infra-temporal & sub-mandibular regions	Vessels - origin, branches/ tributaries and termination and applied anatomy of maxillary artery, pterygoid venous plexus	AN33.1-4 AN34.1
		morphology, relations, nerve supply & applied anatomy of submandibular salivary gland	
7	Mouth, Pharynx & Palate	Parts if any, morphology, relations, blood supply and applied anatomy of - pharynx, palatine tonsil, palate	AN36.1,2 AN39.1
		Tongue - morphology, muscles, nerve & blood supply, lymphatic drainage, applied anatomy	
8	Nose & Larynx	nasal septum, lateral wall of nose - features, blood supply, nerve supply and applied anatomy	AN37.1,2 AN38.1
		paranasal sinuses - number, features, relations, blood supply, nerve supply and applied anatomy	
		Larynx - external & internal features, muscles, nerve supply, blood supply, lymphatic drainage, applied anatomy	
9	Ear & Eye	External ear - parts, blood supply and nerve supply	AN40.1,2 AN41.1
		Middle ear and auditory tube - boundaries, contents, relations and functional anatomy	
		Parts and layers of eyeball	
10	Back	Boundaries and contents of Suboccipital triangle	AN42.2
11	Joints	Craniovertebral joints - type, articular surfaces, ligaments, movements, muscles involved and applied anatomy	AN43.1

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
V HEAD, FACE, NECK			AN26- AN43
NON CORE/ N			
1	Bones	concept of membrane bones, 7th cervical vertebra	AN26.6,7
2	Applied aspects	Anatomical basis of - Frey's syndrome, wry neck, Horner's syndrome, TMJ dislocation, submandibular stones, cervical rib with compression signs, effect of pituitary tumours on visual pathway, tonsillitis, tonsillectomy, adenoids, peri-tonsillar abscess, significance of Killian's dehiscence, sinusitis & maxillary sinus tumours, laryngitis, recurrent laryngeal nerve injury, hypoglossal nerve palsy, otitis externa and otitis media, myringotomy, cataract, glaucoma & central retinal artery occlusion, Thyroid swellings & their significance,	AN28.10 AN29.3 AN30.5 AN31.3 AN33.5 AN34.2 AN35.8,9 AN36.4,5 AN37.3 AN38.2,3 AN39.2 AN40.4,5 AN41.2
3	Muscles	omohyoid, scalenus anterior & medius, levator scapulae, intraocular muscles, semispinalis capitis and splenius capitis - attachments, nerve supply and actions	AN29.4 AN41.3 AN42.3
4	Spaces	Fascial spaces of neck, boundaries and clinical significance of pyriform fossa	AN35.10 AN36.3
5	Ear	features of internal ear	AN40.3

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
VI ABDOMEN AND PELVIS			AN44 - AN53
CORE/ Y			
1	Bones	lumbar vertebrae, sacrum - features, articulations & attachments	AN53.1,2,3
		Pelvis: Types of pelvis, inlet, cavity, outlet of pelvis and pelvimetry and sex differences	
2	Anterior & Posterior abdominal wall	Anterior abdominal wall – planes, quadrants, regions, layers, Muscles, nerve & blood supply, applied aspect	AN44.1-6 AN45.1,2
		Rectus sheath and inguinal canal - site, boundaries, contents, applied aspect	
		Posterior abdominal wall: muscles, fascia, nerves - lumbar plexus	
3	Male external genitalia	Testis - coverings, structure, blood & nerve supply, lymphatic drainage & applied anatomy, Epididymis, Spermatic cord, scrotum, Penis - parts, components, blood supply and lymphatic drainage	AN46.1,2,3
4	Abdominal cavity	Peritoneum – Greater sac, lesser sac, Epiploic foramen, peritoneal folds, pouches, recesses and applied anatomy	AN47.1,2,5,8,9,10, 11,13
		Viscera - Position, features, relations, blood & nerve supply, lymphatic drainage and applied aspects - Stomach, Duodenum, Small and large intestine, Appendix, Liver, Pancreas, spleen, kidney, suprarenal glands, ureter	
		extrahepatic biliary apparatus - Position, parts, features, relations, blood & nerve supply, lymphatic drainage and applied aspects	
		Vessels - formation, course, relations and Branches/ tributaries and applied aspects of Abdominal aorta, Coeliac trunk, Superior mesenteric, Inferior mesenteric, Common iliac artery & Portal vein, Inferior vena cava & Renal vein,	
		thoracoabdominal diaphragm - attachments, openings, nerve supply, actions and applied anatomy	

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
VI ABDOMEN AND PELVIS			AN44 - AN53
CORE/ Y			
5	Pelvic wall and viscera	Pelvic diaphragm - layers, attachments, openings, nerve supply, actions and applied anatomy	AN48.1-4
		Viscera - Position, features, relations, blood & nerve supply, lymphatic drainage and applied aspects - urinary bladder, Rectum and anal canal, vas deference, prostate, urethra, ovary, Uterus, fallopian tubes, vagina	
		Vessels - formation, course, relations and Branches and applied aspects of internal iliac arteries	
		Nerves - Lumbosacral plexus	
6	Perineum	Perineal pouches, ischioanal fossa - site, boundaries, contents, applied aspect	AN49.1-4
		Urogenital diaphragm - layers, attachments, openings, actions and applied anatomy with Perineal body	
7	Vertebral column	curvatures, Intervertebral joints - type, articular ends, ligaments and movements, applied aspect	AN50.1,2 AN42.1
		Contents of the vertebral canal,	
8	Sectional Anatomy	Cross-section at the level of T8, T10 and L1	AN51.1,2
		Midsagittal section of male and female pelvis	

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	COMPETENCY NUMBER	
VI ABDOMEN AND PELVIS			AN44 - AN53
NON CORE/ N			
1	Bones	anatomical basis of Scoliosis, Lordosis, Prolapsed disc, Spondylolisthesis & Spina bifida	AN50.4 AN53.4
		Clinical importance of sacralization of lumbar vertebra, Lumbarization of 1st sacral vertebra, types of bony pelvis & Coccyx	
2	Abdominal wall	Common Abdominal incisions	AN44.7,8 AN47.12
		nerve plexuses of posterior abdominal wall	
3	Back	Major subgroups of back muscles, nerve supply and action	
4	Applied aspects - Abdomen	Anatomical basis - Psoas abscess, Varicocoele, Phimosis & Circumcision, Ascites & Peritonitis, Subphrenic abscess, Splenic notch, Accessory spleens, Kehr's sign, Different types of vagotomy, Liver biopsy (site of needle puncture), Referred pain in cholecystitis, Obstructive jaundice, Calot's triangle, Referred pain around umbilicus, Radiating pain of kidney to groin & Lymphatic spread in carcinoma stomach,	AN44.9 AN44.10 AN47.3,4,6,7
5	Applied aspects - Pelvis	Anatomical basis of - suprapubic cystostomy, Automatic bladder, Urinary obstruction in benign prostatic hypertrophy, benign prostatic hypertrophy & prostatic cancer, Retroverted uterus, Prolapse uterus, Internal and external haemorrhoids, Anal fistula, Vasectomy, Tubal pregnancy & Tubal ligation	AN48.5,6,7
6	Applied aspects - Perineum	Anatomical basis of Perineal tear, Episiotomy, Perianal abscess and Anal fissure and structures palpable during vaginal & rectal examination	AN48.8 AN49.5
7	Diaphragm	abnormal openings of thoracoabdominal diaphragm and diaphragmatic hernia	AN47.14

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
VII NEURO ANATOMY			AN56 - AN63
CORE/ Y			
1	Meninges & CSF	Meninges - layers, extent, Spaces, modifications and applied anatomy	AN56.1,2
		CSF - circulation & applied anatomy	
2	Spinal cord	Features, Cross section - mid-cervical & mid- thoracic level, tracts, Blood supply & clinical anatomy,	AN57.1-4
3	Brain stem	Medulla oblongata, Pons, Midbrain - Features, Blood Supply, cranial nerve nuclei & syndromes	AN58.1-3 AN59.1-3 AN61.1,2 AN62.1
		Sections of Medulla oblongata, Pons, Midbrain - sensory & pyramidal decussation, olivary levels, upper & lower levels of pons, Superior & inferior collicular levels	
		Cranial nerve nuclei with its functional components	
4	Cerebellum	Features, Classification, connections - Superior, middle and inferior cerebellar peduncles, deep cerebellar nuclei, , functions, Blood supply and clinical anatomy	AN60.1,2
5	Cerebrum	Features, sulci and gyri, functional areas & applied anatomy,	AN62.2-6
		White matter – Classification, & corpus callosum, internal capsule –parts, blood supply & applied anatomy,	
		Blood Supply of Brain, Blood brain barrier, Circle of Willis, applied aspects	
		Diencephalon - Parts, relations, Gross connections, major nuclei - Thalamus, hypothalamus, epi, meta & subthalamus, applied aspects	
		Basal ganglia - parts, connections, applied aspects	
		Limbic system - parts, connections, applied aspects	
6	Ventricular System	Overview ventricular system and its communication, CSF circulation,	AN63.1
		Lateral & IIIrd, IVth ventricle - parts, boundaries, features & applied anatomy	
7	ANS	Autonomic nervous system - Parts, connections, functions, applied aspect	

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
VII NEURO ANATOMY			AN56 - AN63
NON CORE/ N			
1	Anatomical aspect	Anatomical basis of - syringomyelia, Effects of medial & lateral medullary syndrome, cerebellar dysfunction, Effects of Benedikt's and Weber's syndrome, congenital hydrocephalus	AN57.5 AN58.4 AN60.3 AN61.3 AN63.2
SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
VIII HISTOLOGY			
VIII A GENERAL HISTOLOGY			AN65 - AN72
CORE/ Y			
1	Intro to lab techniques, Microscope, cell	Microscopy and Types of microscopes and lab techniques for H & E staining Cell: Organelles and cytoskeleton, Cell	
2	Epithelium	Features, classification, functions, cell surface modification, cell junctions, applied aspect	AN65.1
3	Connective tissue	Types - features with examples and functions, cells, matrix and clinical importance.	AN66.1
4	Cartilage	Cells, matrix, classification, each type - structure, example, function, applied aspect	AN71.2
5	Bone	Cells, matrix, classification, Each type - structure, function, applied aspect	AN71.1
6	Muscle	Classification, Each type - structure, ultrastructure, function, applied anatomy	AN67.1,2
7	Nervous tissue	Peripheral nerve - structure, coverings, functions Ganglia - types, cells, distribution	AN68.1,2
8	Blood vessels	Layers, classification, Each type - structure, ultrastructure, function, applied anatomy	AN69.1,2,3
9	Glands	General glands - definition, classification with structure, function and examples	AN70.1
10	Lymphoid tissue	cells, classification, lymph node, Thymus , spleen, , MALT- palatine tonsil - structure, function	AN70.2
11	Skin	Types - features with examples and functions, Cells, appendages	AN72.1
NON CORE/ N			
1	Basic tissues	Ultrastructure of epithelium, connective tissue, muscular tissue, nervous tissue	AN65.2, AN66.2, AN67.3, AN68.3

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
VIII HISTOLOGY			
VIII A SYSTEMIC HISTOLOGY			AN9,25,43,52,64
CORE/ Y			
1	Respiratory Histology	Epiglottis, Trachea, lung - structure, function	AN25.1 AN43.2
2	HFN Histology	salivary glands - serous, mucous, mixed - structure, function and examples	AN43.2 AN52.1
		Tongue - structure, function, taste buds	
		Retina, Cornea - structure, function, cells	
		Endocrine system - Pituitary, Thyroid, parathyroid & suprarenal glands - structure, function, cells	
3	Abdomen & Pelvis Histology	GIT - structure, function, glands & cells - Oesophagus, Stomach-fundus, pylorus, small Intestine – Duodenum, Jejunum, ileum, Large intestine, appendix, Accessory glands- Liver, pancreas, gall bladder	AN52.1
		Urinary system - structure, function, cells - Kidney, ureter, urinary bladder	AN52.2 AN9.2
		Male reproductive system - structure, function, cells - Testis, Epididymis, Vas deferens, prostate, penis	
		Female reproductive system-Ovary, Fallopian tube, uterus, mammary gland, Cervix, Placenta & Umbilical cord	
4	CNS Histology	Cerebrum, Cerebellum & spinal cord	AN64.1
NON CORE/ N			
1	HFN Histology	Structure, function - olfactory epithelium, eyelid, lip, sclero-corneal junction, optic nerve, cochlea- organ of corti, pineal gland	AN43.3
2	Abdomen & Pelvis Histology	Structure, function - Cardiooesophageal junction, Corpus luteum	AN52.3

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
IX EMBRYOLOGY			
IX A GENERAL EMBRYOLOGY			AN76 - AN81
CORE/ Y			
1	Introduction	Stages of human life, terms- phylogeny, ontogeny, trimester, viability	AN76.1
2	Gameto- genesis and fertilization	Cell division – mitosis & meiosis. Stages & Changes - Spermatogenesis, Oogenesis with ovarian cycle Menstrual cycle - Stages & Changes Fertilization - Process, barriers, effects, applied aspects anatomical principles of contraception	AN77.1-5
3	1st week of development	Zygote, cleavage, morula, blastocyst	AN78.1
4	2nd week of development	Implantation - Type, Process, decidual reaction, applied aspects Bilaminar embryonic disc, embryoblast, amniotic cavity, yolk sac, Trophoblast , extra-embryonic mesoderm, chorion anatomical principles of abortion, pregnancy test	AN78.2-5
5	3rd & 4th week of development	Primitive streak, Gastrulation, Trilaminar embryonic disc, , notochord, development of neural tube, Neural crest cells, vasculogenesis. Folding of embryo – craniocaudal and lateral Intraembryonic mesoderm & coelom 3 germ layers and derivatives	AN79.1-4
6	Foetal membrane	Formation, functions & fate of chorion, amnion, allantois, umbilical cord. Placenta - Formation, functions, hormones, foetomaternal circulation, placental barrier and applied aspects Embryological basis of twinning	AN80.1-5
7	Prenatal Diagnosis	Various methods Indications, process and disadvantages of amniocentesis & chorion villous biopsy	AN81.1-3

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
IX GENERAL EMBRYOLOGY			
NON CORE/ N			
1	1st week of development	Teratogenic influences; fertility and sterility, surrogate motherhood, social significance of “sex-ratio”.	AN77.6
2	3rd to 8th week of development	Embryological basis of congenital malformations, nucleus pulposus, sacrococcygeal teratomas, neural tube defects	AN79.5,6
		Diagnosis of pregnancy in first trimester and role of teratogens, alpha-fetoprotein	
3	Foetal membrane	Embryological basis of estimation of fetal age.	AN80.6,7
		Various types of umbilical cord attachments	

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
IX EMBRYOLOGY			
IX B SYSTEMIC EMBRYOLOGY			AN9,13,20,25,43,5 2,64
CORE/ Y			
1	Thorax	Respiratory system - Development of lungs & Pleura	AN25.2-5
		Cardiovascular system - Development of heart - heart tube, 4 chambers, Septa and applied aspects - like ASD, VSD, Fallot's tetralogy,	
		Foetal & neonatal circulation	
2	HFN	development and congenital anomalies of Pharyngeal apparatus	AN43.4
		development and congenital anomalies of tongue, thyroid, face, palate, pituitary	
		development and congenital anomalies of eye	
3	Abdomen & Pelvis	Development and congenital anomalies of GIT – Foregut, midgut, hindgut derivatives	AN52.5-8
		Development and congenital anomalies of Diaphragm	
		Development and congenital anomalies of Kidney, ureter, bladder	
		Development and congenital anomalies of male and female reproductive system	
4	Nervous system	Development of neural tube, spinal cord, medulla oblongata, pons, midbrain, cerebral hemisphere & cerebellum	AN64.2
NON CORE/ N			
1	Limbs	Development of upper limb, lower limb	AN13.8 AN20.10
2	Breast	Development of breast	AN9.3
3	Thorax	Development of aortic arch arteries, SVC, IVC and coronary sinus	AN25.6
4	Abdomen	Describe the development of anterior abdominal wall	AN52.4
5	Nervous system	Describe various types of open neural tube defects with its embryological basis	AN64.3

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
X GENETICS			AN73 - AN75
CORE/ Y			
1	Chromosomes	Introduction, Mendel's Laws	AN73.1,2,3
		Chromosome - structure & classification, Karyotyping - process & application , Barr body, Lyon's hypothesis	
		Structural and numerical chromosomal aberrations	AN75.1
2	Patterns of Inheritance	Various modes of inheritance with examples, Pedigree charts, multifactorial inheritance	AN74.1,2,3
3	Variation	Genetic basis of: polymorphism and mutation	AN75.4
4	Genetic Counseling	Principles	AN75.5
NON CORE/ N			
1	Diseases & syndromes	Genetic basis & clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Haemophilia, Duchene's muscular dystrophy & Sickle cell anaemia, Prader Willi syndrome, Edward syndrome & Patau syndrome	AN74.4 AN75.3
2	Cell lines	Mosaicism and chimerism with example	AN75.2

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
XI RADIOLOGY			AN13,20,25,43,54
CORE/ Y			
1	Introduction	Various imaging techniques with Principles of plain radiographs and CT scan, Ultrasonography, MRI	
2	Upper limb	Bones and joints seen in AP and lateral view radiographs of shoulder, elbow, wrist joints & hand	AN13.5
3	Lower limb	Bones and joints seen in AP and lateral view radiographs of hip, knee, ankle joints and foot	AN20.6
4	Thorax	Structures seen in a plain x-ray chest (PA view)	AN25.7
5	Head, face, neck	Structures seen in 1) Plain x-ray skull -AP and lateral view 2) Plain x-ray cervical spine-AP and lateral view 4) Plain x- ray of paranasal sinuses	AN43.7
6	Abdomen & pelvis	Structures seen in a plain x-ray abdomen	AN54.1,2
		Structures seen in contrast radiographs of Barium swallow, Barium meal, Barium enema, Cholecystography, Intravenous pyelography & Hysterosalpingography	
NON CORE/ N			
1	Head, face, neck	anatomical route used for & structures seen in carotid angiogram and vertebral angiogram	AN43.8,9
2	Abdomen & pelvis	Describe role of ERCP, CT abdomen, MRI, Arteriography in radiodiagnosis of abdomen	AN54.3

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
XII LIVING ANATOMY			AN10,13,17,18,20,43
CORE/ Y			
1	Upper limb	Important bony landmarks : Jugular notch, sternal angle, acromial angle, spine of the scapula, vertebral level of the medial end, Inferior angle of the scapula	AN10.12 AN13.3,6,7
		Testing of muscles: Trapezius, pectoralis major, serratus anterior, latissimus dorsi, deltoid, biceps brachii, Brachioradialis	
		Movements of - Shoulder, elbow, radio-ulnar, wrist, 1st carpometacarpal joints	
		Palpation of radial, brachial arteries, ulnar nerve	
2	Lower limb	Important bony landmarks of : Vertebral levels of highest point of iliac crest, anterior & posterior superior iliac spines, iliac tubercle, pubic tubercle, Mid inguinal point, ischial tuberosity, adductor tubercle, Tibial tuberosity, head of fibula, Medial and lateral malleoli, Condyles of femur and tibia, sustentaculum tali, tuberosity of fifth metatarsal, tuberosity of the navicular	AN17.1 AN18.4 AN20.1,7,8,9
		Palpation of femoral, popliteal, posterior & anterior tibial, dorsalis pedis arteries and common peroneal nerve	
		Movements of - Hip, knee, ankle	
3	HFN	Location of hyoid bone, thyroid cartilage and cricoid cartilage with their vertebral levels	AN43.1,5
		Movements of atlantooccipital joint & atlantoaxial joint	
		Testing of muscles of facial expression, extraocular muscles, muscles of mastication,	
		Palpation of carotid arteries, facial artery, superficial temporal artery	

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
XIII SURFACE MARKING			AN13,20,25,43,55
CORE/ Y			
1	Upper limb	Surface projection of: Cephalic and basilic vein,	AN13.7
2	Lower limb	Surface projection of: femoral nerve, Saphenous opening, Sciatic, tibial, common peroneal & deep peroneal nerve, Great and small saphenous veins	AN20.9
3	Thorax	Surface marking of lines of pleural reflection, lung borders and fissures, trachea,	AN25.9
		Surface marking of heart borders, apex beat & surface projection of valves of heart	
4	Abdomen	Surface marking of; Regions and planes of abdomen, Superficial inguinal ring, Deep inguinal ring , McBurney's point, Renal Angle & Murphy's point	AN55.1
		Surface projections of: Stomach, Liver, Fundus of gall bladder, Spleen, Duodenum, Pancreas, Ileocaecal junction, Kidneys & Root of mesentery	AN55.2
NON CORE/ N			
1	Head, face, neck	Surface projection of Thyroid gland, Parotid gland and duct, Pterion,	AN43.6
		Surface projection of Common carotid artery, Internal jugular vein, Subclavian vein, External jugular vein, Facial artery in the face & accessory nerve	
XIV BIOETHICS			AN82
CORE/ Y			
1	Ethics	Demonstrate respect and follow the correct procedure when handling cadavers and other biologic tissue	AN 82.1

*** Resolution No. 4.1 of AC-41/2021 : Resolved to continue the same AETCOM questions and their distribution for Anatomy, Physiology & Biochemistry as per syllabus in 2019-20, for subsequent batches**

SR. NO.	SUBTOPIC		COMPETENCY NUMBER
	NAME	DESCRIPTION	
* XIV AETCOM			
CORE/ Y			
1		Write dos and don'ts of doctor-patient verbal communication.	
2		Boundaries of the doctor-patient relationship	
3		"Cadaver as our first teacher" Justify	
4		Write a note on importance handling of biological tissues.	
5		Need for biomedical waste management	
6		Enumerate drum/bag colors used with the types of biomedical waste to be disposed in them.	
7		Write note on things you will do & not do in dissection hall to show your respect for cadaver.	
8.		Enumerate different locations in medical colleges and hospitals where biomedical waste disposal	

LECTURE TOPICS – 2019-20

Sr. No.	Unit Name	Competency No.	Topic
1	General Anatomy (11 hours)	AN1.1	Introduction
2		AN1.1	Terminology
3		AN4.1,2,3,4	Skin & Fascia
4		AN2.1, 2.3	Bone
5		AN2.2	Ossification of Bone
6		AN2.5, 6	Joint – I
7		AN2.5, 6	Joint – II
8		AN3.1, 2, 3 AN7.5,6	Muscular System
9		AN5.1,2,3,6,7,8 6.1,2,3	CVS & Lymphatic system
10		AN7.1,2,3,7	Nervous system
11			Imaging techniques
12	Upper Limb (17 hours)	AN9.2	Mammary Gland
13		AN10.8	back muscles
14		AN10.1,4,7	Axilla with axillary lymph nodes
15		AN10.3,5,6	Brachial Plexus
16		AN10.2,13	Axillary vessels & Nerve
17		AN13.4	Pectoral Girdle
18		AN10.10,12	Shoulder joint
19		AN11.1,2,3,5	Compartments of arm and cubital fossa
20		AN13.3	Elbow Joint
21		AN10.9, 11.6	Arterial anastomoses & venous drainage of upper limb

22	Upper Limb	AN13.3	Radio-Ulnar Joint
23		AN12.9,10	Spaces of Hand
24		AN12.7	Blood supply & nerve supply of palm
25		AN12.6 13.3	Wrist Jt. & 1 st CPM Jt.
26		AN12.2,8,12	Median & ulnar nerve
27		AN11.4, 12.2,12,13	Radial Nerve
28		AN13.1,2	Cutaneous nerve supply of upper limb & dermatomes of upper limb
29	Lower Limb (12 hours)	AN20.3,5	Venous drainage of lower limb
30		AN15.3,4	Femoral triangle
31		AN15.5	Adductor canal & obturator nerve
32		AN16.1,2,	Gluteal region
33		AN16.4,5	Back of thigh and sciatic nerve
34		AN17.1,2,3	Hip joint
35		AN16.6	Popliteal fossa
36		AN18.4, 5,6,7	Knee joint
37		AN18.1,2,3, AN19.1,2,3	Compartments of Leg
38		AN20.1	Ankle joint
39		AN20.2	Inversion & Eversion and subtalar joint
40		AN19. 5,6	Arches of foot
41	HFN (39 hours)	AN27.1,2	Scalp
42		AN28.1	Face 1-Muscles of
43		AN28.2,3,4,8	Face 2-Nerve supply & Blood Supply of face with clinical

44	HFN	AN35.1,10	Deep Cervical Fascia
45		AN29.1a, 3,4	Post. triangle of Neck
46		AN42.2,3	Sub-Occipital Triangle with semispinalis capitis and splenius capitis
47		AN32.1,2	Division of Ant. Triangle & carotid triangle
48		AN35.2,8	Thyroid gland
49		AN62.1	Functional component of Cr. Nr. Nuclei
50		AN35.6,7	Cervical sympathetic chain & 11 th Cr. Nr.
51		AN28.9,10	Parotid gland
52		AN28.6,7	Facial nerve
53		AN33.1	Infratemporal fossa & Mandibular nerve
54		AN33.3,2,5	T M Joint & muscles of mastication
55		AN34.1,2	Submandibular region & gland
56		AN35.7	12 th Cranial nerve
57		AN35.7	Styloid App. & 9 th Cranial nerve
58		AN42.1, AN50.1,2,4	Vertebral column & vertebral canal with its contents
59		AN30.3,4, AN56.1	Meninges & Dural venous sinuses
60		AN30.3,4	superior sagittal and cavernous sinus
61		AN30.5	Pituitary gland with development
62		AN31.1,2	Extra ocular muscles
63			Ophthalmic & maxillary division of 5 th Cr. Nr
64		AN31.2,5	3 rd cranial nerve
65		AN31.2,5	4 th & 6 th Cranial nerve
66			Peripheral parasympathetic ganglia

67	HFN	AN41.1,2,3	Parts and layers of eyeball (L)	
68		AN43.1	Cranio vertebral joints	
69		AN36.1,2,3,4,5	Pharynx & palatine tonsil	
70		AN39.1,2	Tongue	
71		AN36.1	Palate	
72		AN37.1	Nasal Septum	
73		AN37.1	Lateral wall of nose	
74		AN37.2,3	Para nasal air sinus	
75		AN38.1,2,3	Larynx-I	
76		AN38.1,2,3	Larynx-II	
77		AN40.2,4,5	Middle ear cavity	
78		AN40.3	Describe the features of internal ear (L)	
79		AN28.5, AN35.5	cervical lymph nodes and lymphatic drainage of HFN	
80		Neuroanatomy (22 hours)	AN57.1,2	Spinal Cord external features with blood supply
81			AN57.3,4,5	Spinal Cord -I - 2 sections, nuclei, descending tracts
82			AN57.3,4,5	Spinal cord -II - tracts, applied anatomy
83			AN58.1,2,3,4	Medulla oblongata -I
84			AN58.1,2,3,4	Medulla oblongata -II
85			AN59.1,2,3	Pons
86	AN61.1,2,3		Midbrain	
87	AN60.1,2,3		Cerebellum	
88	AN62.5		Thalamus	
89	AN62.5		Hypothalamus	

90	Neuroanatomy	AN62.5	Boundaries, parts, gross relations, major nuclei and connections of epithalamus and subthalamus
91		AN62.4	Basal ganglia
92		AN62.2	Cerebrum -I
93		AN62.2	Cerebrum -II
94		AN63.1,2	Lateral Ventricles & III ventricle
95		AN56.2, AN63.1,2	4 th ventricle & CSF circulation
96		AN62.6	Blood supply of brain
97		AN62.3	White fibres of cerebrum with corpus callosum
98		AN62.3	Internal capsule
99		AN62.4	Limbic system
100			Autonomic nervous system
101			Revision lecture
102		Thorax (15 hours)	AN21.3,8
103	AN21.4,5,6,7,10		Intercostal space
104	AN24.1		Pleura
105	AN24.1,2,3,5		Lung & Bronchopulmonary segments
106	AN21.11		Division of Mediastinum, sup.mediastinum
107	AN23.1		Oesophagus
108	AN21.11		Posterior Mediastinum + splanchnic nerves
109	AN22.1,2		Exterior of heart & Pericardium
110	AN22.2		Interior of heart
111	AN22.6,7		fibrous skeleton of heart & conducting system of heart

112	Thorax	AN22.3,4,5	Coronary circulation
113		AN23.3	Azygous veins
114		AN23.2,7	Thoracic duct + Right lymphatic duct (L)
115		AN47.13,14	Diaphragm
116		AN21.9,	movements of respiration
117		Abdomen & Pelvis (27 hours)	AN44.1,2,6
118	AN44.3,7		Rectus sheath & abdominal incisions
119	AN44.4,5		Inguinal canal
120	AN46.1,2,4		Testies
121	AN47.1,2,3,4		Peritoneum I
122	AN47.1,2,3,4		Peritoneum II
123	AN47.5,6		Stomach
124	AN47.5,6		Duodenum
125	AN47.8,10,11		Portal vein & circulation
126	AN47.5,6		Extra Hepatic Billiary app.
127	AN47.5,6		Pancreas
128	AN47.5,6		Spleen
129	AN47.5,6		Caeum & Appendix
130	AN47.5,6		Kidney
131	AN45.1, AN47.12		Post. Abdominal wall with Thoracolumbar fascia ,
132	AN45.2		Lumbar & Lumbosacral plexus
133	AN47.9		Abdominal aorta & its branches
134	AN51.1		cross-section at the level of T8, T10 and L1

135	Abdomen & Pelvis	AN48.2,5,6	Urinary bladder
136		AN48.2,5,7	Prostate
137		AN48.2,5	Uterus & its support
138		AN48.2,5	Rectum
139		AN48.2,5,8	Anal canal
140		AN48.1	Pelvic floor
141		AN49.4,5	Ischioanal fossa
142		AN49.1,2,3,5	Perineal pouches
143		AN50.2	Intervertebral joints, Sacroiliac joints & Pubic symphysis (LD)
144		General Histology (14 hours)	
145	AN65.1		Epithelium
146	AN65.1		Epithelium
147	AN70.1		Glands
148	AN66.1		Connective tissue
149	AN71.2		Cartilage
150	AN71.1		Bone
151	AN67.1,2		Muscle tissue
152	AN68.1,2		Nervous tissue
153	AN69.1,2,3		Blood vessels
154	AN70.2		Lymphatic tissue -I
155	AN70.2		Lymphatic tissue -II
156	AN72.1		Skin
157			Revision lecture

158	Systemic Histology (16 hours)	AN25.1, AN43.2	Respiratory system + olfactory epithelium
159		AN52.1	(salivary glands)
160		AN52.1	lip, Tongue
161		AN52.1	GIT-1 general features of GIT & oesophagus
162		AN52.1	GIT-2 (stomach +Cardioesophageal junction)
163		AN52.1	GIT-3 (Small & Large Intestine)
164		AN52.1	GIT -4 (accessory glands)
165		AN52.2	Urinary system
166		AN52.2	Male reproductive system + Penis
167		AN52.2	Female reproductive system – 1 (ovary, + Corpus luteum & Fallopian tube)
168		AN52.2	Female reproductive system – 2 (cervix, uterus)
169		AN52.2, AN9.2	Female reproductive system - 3 (Mammary gland + placenta & umbilical cord)
170		AN52.1	Endocrine + pineal gland
171		AN52.1	special senses + eyelid, sclero-corneal junction, optic nerve + cochlea- organ of corti
172		AN64.1	Central nervous system
173			Revision lecture
174	General Embryology (14 hours)		Mitosis & Meosis
175		AN77.3	Gamatogenesis
176		AN77.1, 2	Ovarian & menstrual cycles
177		AN77.4, AN78.1, 3	Fertilization, Implantation
178		AN78.4	2 nd week of development
179		AN79.1, 2	3 rd week -1 (primitive streak, gastrulation & notochord)

180	General Embryology	AN79.3	3 rd week -2 (Neural tube & 3 germ layers)
181		AN79.4	4 th week – folding , development of anterior abdominal wall & Embryonic period
182		AN80.3	Placenta
183		AN79.6, AN80.6	diagnosis of pregnancy in first trimester & embryological basis of estimation of fetal age.
184		AN78.5, AN77.5, AN79.6	anatomical principles underlying contraception + in brief abortion & teratogens
185		AN77.6	ertility and sterility, surrogate motherhood, social significance of “sex-ratio”.
186		AN80.4	embryological basis of twinning in monozygotic & dizygotic twins
187			Revision lecture
188		Systemic Embryology (24 hours)	AN13.8, AN9.3
189	AN43.4		Pharyngeal arches
190	AN43.4		Tongue and thyroid
191	AN43.4		Face and palate
192	AN43.4		development and developmental basis of congenital anomalies of eye
193	AN25.2,4,5		Cardio vascular system - 1 (Heart)
194	AN25.2,4,5		Cardio vascular system - 2 (Heart)
195	AN25.2,4,5		Cardio vascular system – 3 (Arteries)
196	AN25.2,4,5		Cardio vascular system – 3 (Veins)
197	AN25.3		Fetal & Neonatal circulation
198	AN52.5		Body cavities & diaphragm
199	AN25.1		Respiratory system
200	AN64.2,3		Describe the development of neural tube, cerebral hemisphere & cerebellum
201	AN64.2,4		Describe the development of spinal cord, medulla oblongata, pons, midbrain,

202	Systemic Embryology	AN64.2,5	Describe various types of open neural tube defects with its embryological basis
203		AN52.6	Gastro intestinal system – 1
204		AN52.6	Gastro intestinal system – 2
205		AN52.6	Gastro intestinal system – 3
206		AN52.6	Gastro intestinal system – 4
207		AN52.7	Urinary system - Kidney & Ureter
208		AN52.8	Reproductive system - 1
209		AN52.8	Reproductive system - 2
210		AN52.8	Reproductive system - 3
211			Revision lecture
212		Genetics (10 hours)	
213	AN73.1		Structure of gene & chromosome
214	AN73.2		Karyotyping
215	AN75.1		Chromosomal aberrations
216	AN74.1,2,3		Inheritance
217	AN75.5		PND & Genetic Counseling
218	AN74.3		Describe multifactorial inheritance with examples
219	AN74.4		Describe the genetic basis & clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Haemophilia, Duchene's muscular dystrophy & Sickle cell anaemia
220	AN75.3		Describe the genetic basis & clinical features of Prader Willi syndrome, Edward syndrome & Patau syndrome
221	AN75.4		Describe genetic basis of variation: polymorphism and mutation
222	Bioethics (1 hour)	AN 82.1	Biomedical waste disposal

Anatomy paper wise syllabus distribution (Prelim & University)

Paper I

- Upper Limb
- Thorax
- Head, Face & Neck
- Neuroanatomy
- Related Systemic Histology
- Related Systemic Embryology
- Genetics
- AETCOM – 1 SAQ (Module – 1.2,1.3)

Paper II

- Lower Limb
- Abdomen
- Pelvis
- Related Systemic Histology
- Related Systemic Embryology
- General Anatomy
- General Histology
- General Embryology

MGMIHS
1st year MBBS. CBME
Format for Internal assessment examinations

Sr. No.	Exam	Theory	Practical
1.	Internal assessment examinations	200	100
2.	Preliminary examination	200	100
Total		400	200

- Preliminary examination pattern will be as per University examination
- Respective colleges/ departments will conduct internal assessment examinations and maintain records of the same.

***Resolution No. 4.8 of AC-41/2021:** Resolved to approve the change in the pattern of Internal Assessment calculations, to be implemented from current batch of 1st MBBS (CBME) (i.e. AY- 2020-21) onwards

Annexure-27C of AC-41-2021

MGM Medical College, Navi Mumbai & Aurangabad

1st year MBBS CBME

INTERNAL ASSESSMENT CALCULATION

Sr. No.	Criteria	Theory	Practical
1.	*All internal assessment examinations including preliminary examination	50	50
2.	Day to Day assessment		
	➤ Day to Day assessment (PBL/ TBL/ Seminar/ MCQ test etc)	30	
	➤ Day to Day assessment (Viva/ Spotters/ OSPE / OSVE etc)		30
3.	Logbooks (Foundation Course, AETCOM, Competency logbook, SDL – each 5 marks)	20	
	Journals + ECE Logbook		20
Total		100	100

FORMAT FOR INTERNAL ASSESSMENT EXAMINATIONS

Sr. No.	Exam	Theory	Practical
1.	Internal assessment examinations (Midterm + Terminal)	200 (100 + 100)	100 (50 + 50)
2.	Preliminary examination	200	100
3.	Additional examination for students who have missed any of 3 internal assessment exams or are not qualifying	200	100

***Internal assessment examinations marks conversion to internal assessment marks -**

Student's internal assessment examinations scores [Midterm, Terminal, Preliminary and additional (where applicable)] will be converted to 50 marks each for theory and practical internal assessment.

MGMIHS
I MBBS CBME
UNIVERSITY EXAMINATION PATTERN
I MBBS - HUMAN ANATOMY

Part of exam	Marks
Theory Paper I	100 Marks
Theory Paper II	100 Marks
Practical	100 Marks
Total	300 Marks

FORMAT FOR INTERNAL ASSESSMENT EXAMINATIONS

Sr. No.	Exam	Theory	Practical
1.	Internal assessment examinations (Midterm + Terminal)	200 (100 + 100)	100 (50 + 50)
2.	Preliminary examination	200	100
3.	Additional examination for students who have missed any of 3 internal assessment exams or are not qualifying for University exam *Marks to be computed as per the missed exam or low score exam for not qualifying students.	200	100

***Internal assessment examinations marks conversion to internal assessment marks -**

Theory – Total 400 marks will be converted to 50

Practical – Total 200 marks will be converted to 50

INTERNAL ASSESSMENT CALCULATION

Sr. No.	Criteria	Theory	Practical
1.	*All internal assessment examinations including preliminary examination	50	50
2.	Day to Day assessment		
	➤ Day to Day assessment (PBL/ TBL/ Seminar/ MCQ test etc)	30	
	➤ Day to Day assessment (Viva/ Spotters/ OSPE / OSVE etc)		30
3.	Logbooks (Foundation Course, AETCOM, Competency logbook, SDL – each 5 marks)	20	
	Journals + ECE Logbook		20
Total		100	100

BLUEPRINT OF UNIVERSITY QUESTION PAPER

1. THEORY EXAMINATION PATTERN

1. 1. Theory Question Paper Pattern:

Two papers each of 3 hours duration and carrying 100 marks each.

1.2. Marks distribution for each paper:

Type of question	Numbers X Marks	Total marks
Multiple Choice Questions	20 X 1	20
Long Answer Questions (LAQ)	2 X 10	20
Short Answer Questions (SAQ)	6 X 5	30
Brief Answer Questions (BAQ)	10 X 3	30
Total		100

Each Paper is divided into 3 sections:

Section A: MCQ 20 marks

Section B: 40 marks: BAQ 5/6 x 3= 15; SAQ 3/4 x 5= 15; LAQ 1/2 x 10 = 10

Section C: 40 marks: BAQ 5/6 x 3= 15; SAQ 3/4 x 5= 15; LAQ 1/2 x 10 = 10

1.3. Paper I & Paper II Contents

1.3.a. Paper I

- Upper Limb
- Thorax
- Head, Face & Neck
- Neuroanatomy
- Related Systemic Histology
- Related Systemic Embryology
- Genetics
- AETCOM – 1 SAQ (Module – 1.3,1.5)

1.3.b. Paper II

- Lower Limb
- Abdomen
- Pelvis
- Related Systemic Histology
- Related Systemic Embryology
- General Anatomy
- General Histology
- General Embryology

1.4. Note to exam paper setters (Ref.: GMER 2019- Assessment)

1.4.A Multiple Choice Questions (MCQs) (20X1=20 Marks)		
<ul style="list-style-type: none"> 10 % of MCQ marks should be from clinically based questions (Any 2) 		
1.4. B Brief Answer Questions (BAQs) (10X3=30 Marks)		
Various Levels of Cognitive Domain must be considered as follows:		
Level of cognitive domain	Number of questions	Marks
Knowledge	3	3X3=9
Comprehension	3	3X3=9
Application	2	2X3=6
Analysis	2	2X3=6
Synthesis	1	1X3=3
Evaluation	1	1X3=3
1.4. C Short Answer Questions (SAQs) (6X5=30 Marks)		
1 SAQ will be clinical application based (In section B)		
1 SAQ will be from AETCOM modules (In Paper I)		
Various Levels of Cognitive Domain must be considered as follows:		
Level of cognitive domain	Number of questions	Marks
Knowledge	2	2X5=10
Comprehension	2	2X5=10
Application	1	1X5=5
Analysis	1	1X5=5
Synthesis	1	1X5=5
Evaluation	1	1X5=5
1.4.D Long Answer Question (LAQ) (2X10=20 Marks)		
<ul style="list-style-type: none"> Long Answer Questions (LAQ) in both Papers I & II must be structured, covering various levels of cognitive domain. 		

1.4.E Percentage of marks allotted to various levels of cognitive domains:

Level of cognitive domain	Marks (Total = 76)	Percentage (%)
1. Knowledge	19	25
2. Comprehension	19	25
3. Application	11	15
4. Analysis	11	15
5. Synthesis	8	11
6. Evaluation	8	10

1.4.F Verbs in various levels in Knowledge domain.

Level	Suggested Verbs
Knowledge (Remember)	Define, describe, Draw, Find, Enumerate, Cite, Name, Identify, List, Label, Match, Sequence, Write, State
Comprehension (Understand)	Discuss, Conclude, Articulate, Associate, Estimate, Rearrange, Demonstrate understanding, Explain, Generalise, Identify, Illustrate, Interpret, Review, Summarise
Application (Apply)	Apply, Choose, Compute, Modify, Solve, Prepare, Produce, Select, Show, Transfer, Use
Analysis (Analyze)	Analyse, Characterise, Classify, Compare, Contrast, Debate, Diagram, Differentiate, Distinguish, Relate, Categorise
Synthesis (Create)	Compose, Construct, Create, Verify, Determine, Design, Develop, Integrate, Organise, Plan, Produce, Propose, Rewrite
Evaluation (Evaluate)	Appraise, Assess, Conclude, Critic, Decide, Evaluate, Judge, Justify, Predict, Prioritise, Prove, Rank

(Reference GMER-2019, Assessment Module Page no.17& Revised Bloom's Taxonomy by Anderson, L.W. et al in (2001))

1.5. Paper I

S. No.	Topics	MCQ (20 x 1 = 20 marks)	Brief Answer Question (BAQ) (10 x 3 = 30 marks)	Short Answer Question (SAQ) (6 x 5 = 30 marks)	Long Answer Question (LAQ) (2 x 10 = 20 marks)	Total Marks
1	Upper Limb / Thorax	3 X 1 = 3 (Upper limb) 3 X 1 = 3 (Thorax)	2 X 3 = 6 Upper Limb/Thorax - from the region not covered in LAQ&SAQ	1 X 5 = 5 (Upper Limb/Thorax - from the region not covered in LAQ&BAQ	1 X 10 = 10 (Upper Limb/Thorax)	27 (as option - 8)
2	Head and Neck / Neuro-anatomy	4 X 1 = 4 (HFN) 4 X 1 = 4 (Neuro-anatomy)	3 X 3 = 9 HFN / Neuroanatomy- from the topic not covered in LAQ& SAQ	1 X 5 = 5 HFN / Neuroanatomy - from the topic not covered in LAQ&BAQ	1 X 10 = 10 HFN / Neuroanatomy	32 (as option - 8)
3	Systemic Histology Thorax / HFN / Neuro-anatomy	2 X 1 = 2	2 X 3 = 6 Thorax/HFN/ Neuroanatomy- from the topic not covered in LAQ& SAQ	1 X 5 = 5 Thorax/ HFN/ Neuroanatomy- from the topic not covered in LAQ& BAQ		13
4	Systemic Embryology Thorax / Head and Neck / Neuro-anatomy	2 X 1 = 2	2 X 3 = 6 Thorax / HFN/ Neuroanatomy - from the topic not covered in LAQ& SAQ	1 X 5 = 5 (Thorax/ HFN/ Neuroanatomy - from the topic not covered in LAQ& BAQ		13
5	Genetics	2 X 1 = 2	1 X 3 = 3 - from different topic thanSAQ	1 X 5 = 5 - from different topic thanBAQ		10
6	AETCOM			1 X 5 = 5		5
			1 extra* question as option from Upper Limb / Thorax / HFN/ Neuroanatomy (Marks are shown as option in respective topic)	1 extra* question as option from Upper Limb / Thorax / HFN/ Neuroanatomy (Marks are shown as option in respective topic)		
			*extra question asked as option should be from different topics for BAQ & SAQ			
	Total	20	30	30	20	100

1.6. Paper II

S. No.	Topics	MCQ (20 x 1 = 20 marks)	Brief Answer Question (BAQ) (10 x 3 = 30 marks)	Short Answer Question (SAQ) (6 x 5 = 30 marks)	Long Answer Question (LAQ) (2 x 10 = 20 marks)	Total Marks
1	Lower Limb / Pelvis	2 X 1 = 2 Lower Limb 4 X 1 = 4 Pelvis	3 X 3 = 9 Lower limb/ Pelvis - from the topic not covered in LAQ& SAQ	1 X 5 = 5 Lower limb/ Pelvis - from the topic not covered in LAQ& BAQ	1 X 10 = 10 (Lower Limb / Pelvis)	30 (as option - 8)
2	Abdomen	4 X 1 = 4	2 X 3 = 6 - from the topic not covered in LAQ& SAQ	1 X 5 = 5 - from the topic not covered in LAQ& BAQ	1 X 10 = 10 (Abdomen)	25 (as option - 8)
3	Systemic histology Abdomen Pelvis	2 X 1 = 2	1 X 3 = 3 Abdomen/ pelvis - from the topic not covered in LAQ& SAQ	1 X 5 = 5 Abdomen/ Pelvis - from the topic not covered in LAQ& BAQ	-	5 + 5 + 5 = 15
4	Systemic embryology Abdomen Pelvis	2 X 1 = 2	1 X 3 = 3 Abdomen/ Pelvis - from the topic not covered in LAQ& SAQ		-	
5	General Anatomy (GA)	2 X 1 = 2	1 X 3 = 3 - from different topic than SAQ	1 X 5 = 5 - from different topic than BAQ		10 (as option - 8)
6	General Histology (GH)	2 X 1 = 2	1 X 3 = 3 - from different topic than SAQ	1 X 5 = 5 - from different topic than BAQ		10 (as option - 8)
7	General Embryology (GE)	2 X 1 = 2	1 X 3 = 3 - from different topic than SAQ	1 X 5 = 5 - from different topic than BAQ		10 (as option - 8)
			1 extra* question as option from Lower limb/ Pelvis / abdomen / GA / GH / GE (Marks are shown 'as option' in respective topic)	1 extra* question as option from Lower limb/ Pelvis / abdomen / GA / GH / GE (Marks are shown 'as option' in respective topic)		
			*extra question asked as option should be from different topics for BAQ & SAQ			
	Total	20	20	30	30	100

2. PRACTICAL EXAMINATION PATTERN

2.1. Total Practical Marks 70 marks

II.1.b Histology	
Spotters	10X 1 = 10 marks
Discussion	10 marks (General Histology – 5 marks; Systemic Histology – 5 marks)
Total	20 marks

2.2. Spotters distribution

2.2.b. Histology Spotters distribution (Each Spotter carries 1 mark)	Nos.
General Histology	4
Systemic Histology	6

2.3. TABLE DISCUSSION

Sr. no.	Heading	Marks
1	Soft parts above diaphragm	13
2	Soft parts below diaphragm	12
3	Axial Skeleton	10
4	Radiology	5
5	Surface & living anatomy	5
Total		45

2.4. OTHER HEADINGS

Total Marks		5 marks
1	Communication Skills	5

2.5. VIVA VOCE EXAMINATION PATTERN

Total Marks		30 marks
1	Appendicular skeleton	15 marks
2	Embryology	10 marks
3	Genetics	5 marks
Total		30 marks

Eligibility to appear for university exams	
Internal Assessment (Theory + Practical)	50% - Combined theory & practical [Theory - minimum 40% Practical- minimum 40%]
Criteria for pass in university exams	
Theory	50% aggregate (Paper I + II) (Each Paper minimum 40%)
Practical	50%

Format of question paper

Time – 3 hrs.

Preliminary / University examination

(* Applicable from 2020-21 Batch onwards)

Each subject – 2 papers (I / II) – 100 X 2 = **Total 200 Marks**

Each paper –

- **Section A** – MCQ – 20 X 1 mark = **20 Marks**

➤ **10% MCQ i.e. 2 in each paper must be clinical based**

- **Section B** -

Q1. Answer any 5 out of 6 (BAQ)

(5X3 marks =15 marks)

Q2. Answer any 3 out of 4 (SAQ)

(3X5 marks =15 marks)

- 1 SAQ will be clinical application based
- 1 SAQ will be from **AETCOM modules (in Paper I)**

Q3. Answer any 1 out of 2(LAQ)

(1X10 marks =10marks)

➤ LAQ should be structured (With defined marks distribution)

- **Section C** –

Q1. Answer any 5 out of 6 (BAQ)

(5X3 marks =15marks)

Q2. Answer any 3 out of 4 (SAQ)

(3X5 marks =15 marks)

Q3. Answer any 1 out of 2 (LAQ)

(1X10 marks =10marks)

LAQ should be structured (With defined marks distribution)

Practical Examination (Prelim & University) For Anatomy

Sr. No.	Topic	Marks	Total marks
1	Histology Spots (10 spots)	10 X 1	10
2	Histology Slide Discussion (2 slides)	2 X 5	10
3	Soft parts above diaphragm		13
4	Soft parts below diaphragm		12
5	Axial Skeleton		10
6	Radiology		5
7	Surface & living anatomy		5
8	Communication Skills		5
9	Viva –		30
10	Appendicular skeleton	15	
	Embryology	10	
	Genetics	5	
Total			100

For formative exams I & II – practical will be total 50 marks

Sr. No.	Topic	Marks	Total marks
1.	Histology Spots (5 spots)	5 X 1	5
2.	Histology Slide Discussion (1 slide)	1 X 5	5
3.	Soft part		15
4.	Embryology		5
5.	Radiology + Surface & living anatomy		5
6.	Viva – Bones + communication skill (2)	10+2	12
7.	Journal		3
Total			50

SPECIFIC MARK DISTRIBUTION IN MCQ PAPER IN ANATOMY

Paper I

Sr. No.	Topic	No. of Questions
1.	Upper Limb	3
2.	Thorax	3
3.	Systemic Histology	2
4.	Systemic Embryology	2
5.	Head, Face & Neck	4
6.	Neuroanatomy	4
7.	Genetics	2
Total		20

Paper II

Sr. No.	Topic	No. of Questions
1.	Lower Limb	2
2.	Abdomen	4
3.	Pelvis	4
4.	Systemic Histology	2
5.	Systemic Embryology	2
6.	General Histology	2
7.	General Embryology	2
8.	General Anatomy	2
Total		20

10 % of MCQ marks should be from clinically based questions

Duration – 3 Hours (Section A = 30 Minutes, Section B & C = 2 ½ Hours)

Resolution No. 4.10 of AC-41/2021
effective from 2021-22 onwards and
to be revised as per question paper blue printing format
as per 4.9 of AC-41/2021 in next BOS

SECTION – B

Annexure No. 29A of AC-41/2021

Q.1 Answer any 5 out of 6 (SAQ)

(5x3 Marks = 15 Marks)

- List boundaries (2) and contents (1) of axilla
- Enumerate tributaries of azygos vein
- Draw a neat labelled diagram of nerve supply of scalp
- Write any 3 things each, you will do and not do in dissection hall to show your respect for cadaver
- List features of lateral medullary syndrome with their anatomical basis
- List any 3 types of modes of inheritance with 1 example of each

Q.2 Answer any 3 out of 4 (BAQ)

(3x5 Marks = 15 Marks)

- A 30-year-old 7-month pregnant female, slowly developed burning pain in her left thumb, and 1st 2 fingers with exacerbation in night. There is gradual progressive weakness of thenar muscles, with loss of grasping, pinching movements of thumb.
 - What is the name of the condition? (1)
 - Explain the clinical features of this condition with their anatomical basis. (4)
- Specify development of inter-ventricular septum (4) with its any one anomaly (1).
- Write attachments (2), nerve supply (1), action (1) and applied anatomy (1) of Sternocleidomastoid muscle
- Describe microscopic anatomy of tongue with a neat labelled diagram

Q.3 Answer any 1 out of 2 (LAQ)

(1x10 Marks = 10 Marks)

- Describe the mammary gland under the following heads
 - Gross features - 3
 - Lymphatic drainage - 2
 - Arterial supply & venous drainage - 3
 - Any 2 applied aspects - 2

OR

- Describe the thyroid gland under following heads
 - Gross features - 2
 - Blood supply - 2
 - Microscopic anatomy - 2
 - Development - 2
 - Any 1 applied aspect - 2

SECTION – C

Q.1 Answer any 5 out of 6 (SAQ)

(5x3 Marks = 15 Marks)

- a. List the extraocular muscles (2) with their nerve supply (1)
- b. Enumerate structures forming styloid apparatus
- c. What is the extent of external carotid artery? (1) List its branches. (2)
- d. Draw and label the diagram of the floor of the IV ventricle
- e. List features of Turner syndrome
- f. Draw and label the diagram of microscopic anatomy of cornea

Q.2 Answer any 3 out of 4 (BAQ)

(3x5 Marks = 15 Marks)

- A. Write attachments (2), nerve supply (0.5), action(2) and applied anatomy (0.5) of Deltoid muscle.
- B. Explain boundaries of superior mediastinum with diagram (2). List its contents (2) with any 1 applied aspect (1)
- C. Describe circle of Willis' as follows – Location (0.5), Formation (1.5), Branches & distribution (2), Any one applied aspect (1)
- D. What are pharyngeal arches? (1) List derivatives from cartilage (1), muscle (2), nerve (0.5) and artery of 1st pharyngeal arch (0.5)

Q.3 Answer any 1 out of 2 (LAQ)

(1x10 Marks = 10 Marks)

- A. Describe arterial supply of heart under the following headings **for each artery** –
Origin (1), Course (2), Branches (3) and Distribution (2).
Also write any 1 applied aspect of arterial supply of heart – (2)

OR

- B. Write classification of **white matter** of brain with examples. – 3
Describe **internal capsule** under the following headings –
 - a) Parts & relations – 2
 - b) Fibres passing through – 3
 - c) Applied anatomy – 2

Duration – 3 Hours (Section A = 30 Minutes, Section B & C = 2 ½ Hours)

SECTION – B

Q.1 Answer any 5 out of 6 (SAQ)

(5x3 Marks = 15 Marks)

- a. Draw neat labelled diagram of blood supply of long bone.
- b. What is neural crest? (1) List its derivatives (2)
- c. List boundaries (2) and contents (1) of popliteal fossa
- d. Draw and label anterior relations of left kidney
- e. Explain interior of urinary bladder with a neat labelled diagram
- f. List the derivatives of foregut, midgut and hindgut

Q.2 Answer any 3 out of 4 (BAQ)

(3x5 Marks = 15 Marks)

- A. Compare microscopic structure of Cardiac and skeletal muscle with diagram
- B. 45-year-old alcoholic male came to hospital with complaints of blood in vomiting. On examination he also had dilated tortuous linear swellings radiating from umbilicus.
 - A. Name the clinical presentation seen around umbilicus. (1)
 - B. What is the common clinical basis leading both the given presentations? (1)
 - C. Explain anatomical basis of the both presentations. (3)
- C. Describe interior of anal canal with a neat labelled diagram. (4) Write it's any 1 applied aspect. (1)
- D. Describe medial longitudinal arch as follows – formation (2), factors maintaining (2) and applied anatomy (1)

Q.3 Answer any 1 out of 2 (LAQ)

(1x10 Marks = 10 Marks)

A. Describe hip joint under following heads

- Type & bones taking part – 2
- Relations – 3
- Movements and muscles – 3
- Applied anatomy – 2

OR

B. Describe the pancreas under following heads

- Gross anatomy – 3
- Blood supply – 2
- Microscopic anatomy. – 2
- Ducts – 2
- Any one applied aspect – 1

SECTION – C

Q.1 Answer any 5 out of 6 (SAQ)

(5x3 Marks = 15 Marks)

- a. List layers of epidermis in thick and thin skin
- b. List the structures in the stomach bed
- c. Draw neat labelled diagram of microscopic anatomy of duodenum.
- d. What is foot drop (1). Explain anatomical basis of its features. (2)
- e. Specify the ligaments of spleen with their attachments and contents.
- f. List the contents of female superficial perineal pouch

Q.2 Answer any 3 out of 4 (BAQ)

(3x5 Marks = 15 Marks)

- A. What is cartilagenous joint? (1) Classify (1) and compare (2) cartilagenous joints with examples (1).
- B. What is implantation? (1) Specify its process (3) with any one example of its applied aspect (1)
- C. Describe descent of testis (4) with its any 1 applied aspect (1)
- D. Write attachments (2), nerve supply (1), action (1) and any one applied aspect (1) of Gluteus maximus muscle

Q.3 Answer any 1 out of 2 (LAQ)

(1x10 Marks = 10 Marks)

A. Describe the uterus under following heads.

- Parts and relations - 4
- Arterial supply - 1
- Supports of uterus - 4
- Any 1 applied aspect - 1

OR

B. Describe the inguinal canal under following heads.

- Boundaries - 4
- Contents - 2
- Any 2 safety mechanisms - 2
- Any one applied aspect - 2

Resolution No. 4.3 of AC=-41/2021: Resolved to approve the booklist for 1st MBBS (CBME) Anatomy with effect from the batch admitted in 2021-22 onwards

Annexure—5.1

Annexure-22A of AC-41-2021

SR.NO.	NAME OF THE BOOK	EDITION
	GROSS ANATOMY	
1.	BD chaurasia's Human Anatomy- vol.1,2,3,4	8th
2.	Vishram Singh's Textbook of Anatomy- vol. 1,2,3	3rd
3.	Vishram Singh's Textbook of neuroanatomy	4th
4.	BD chaurasia's General Anatomy	6th
5.	Netter's Human Anatomy Atlas	7th
6.	Grant's Human Anatomy Atlas	13th
7.	Vishram Singh's General Anatomy	
8.	Gray's anatomy for students	
	EMBRYOLOGY	
1.	Textbook of Human Embryology- Yogesh Sontakke	1st
2.	Inderbir Singh's Human Embryology	12th
3.	Langman's Medical Embryology	13th
	HISTOLOGY	
1.	Inderbir Singh's Textbook of Human Histology	9th
2.	JP Gunsegaran Textbook of Histology	3rd
3.	Histology text and atlas – Brijesh Kumar	2nd
	GENETICS	
1.	GP Pal Textbook of Medical Genetics	3rd
2.	Human Genetics – S. D. Gangane	4th
	SURFACE ANATOMY AND RADIOLOGY	
1.	Surface and Radiological Anatomy – A. Halim	3 rd

Anatomy Textbooks & reference books for MBBS (CBME batch)

REFERENCE

SR.NO.	NAME OF THE BOOK	EDITION
	GROSS ANATOMY	
1.	Gray's Anatomy	41st
2.	Snell's Clinical Anatomy	9th
3.	Neeta Kulkarni's Clinical Anatomy	2nd
4.	A. K. Datta- Essentials of Human Anatomy	9th
	EMBRYOLOGY	
1.	Keith Moore's Clinical Embryology	10th
2.	A. K. Datta- Essentials of Human Embryology	3rd
	HISTOLOGY	
1.	Janqueira's Basic Histology	13th
2.	Difiore's Atlas of Histology	12th
	GENETICS	
1.	Emery's Elements of Medical Genetics	14th

Resolution No. 4.13 of AC-41/2021: Resolved to approve the two books - Communication skills & Early clinical Exposure, as reference books for Medical College Library and departments

1. Communication Skills in Clinical Practice - KR Sethuraman
2. Textbook of Early clinical Exposure Setting and Planning - Dr. Motilal C Tayade

Resolution No. 3.4 of Academic Council (AC-42/2022): Resolved to approve model question papers of Anatomy as per subject blueprint and addition of point about available choice of option in LAQ of both papers (Sections B & C) in Anatomy blueprint for First MBBS theory with effect from the batch admitted in academic year 21-22.

This change is to be included in pattern of examination in CBME curriculum Anatomy for First MBBS. [ANNEXURE-6A & 6C]

~~Annex-4a~~

Annex-6A of AC-42/2022

Department of Anatomy, MGM Medical College, Navi Mumbai
1st year MBBS
University Examination – Paper 1

INSTRUCTIONS

1. Attempt all questions
 2. Maximum marks are indicated in the right
 3. Illustrate the answers with suitable diagrams wherever necessary
 4. Mobile phones, pagers, bluetooth or any others such communication devices are not allowed in examination premises and in the adjacent area.
-

Section A (20X1mark = 20 marks)

1. What structure does NOT lie in the anatomical snuff box?
 - a) Cephalic vein
 - b) Radial artery
 - c) Scaphoid
 - d) **Extensor pollicis longus**
2. Flexor retinaculum is not attached to which bone?
 - a) Scaphoid
 - b) **Trapezoid**
 - c) Pisiform
 - d) Hamate
3. Which muscle arises from both the radius and ulna?
 - a) Extensor pollicis longus
 - b) Extensor pollicis brevis
 - c) **Abductor pollicis longus**
 - d) Abductor pollicis brevis
4. Which one is not the content of posterior mediastinum?
 - a) Esophagus
 - b) Descending aorta
 - c) **Arch of aorta**
 - d) Vagus nerve
5. Rough part of left ventricle develops from which structure?
 - a) **Primitive ventricular chamber**
 - b) Proximal part of bulbus cordis
 - c) Middle part of bulbus cordis
 - d) Distal part of bulbus cordis
6. Left superior intercostal vein opens in which vein?
 - a) **Left brachiocephalic vein**
 - b) Superior vena cava
 - c) Azygos vein
 - d) Hemi-azygos vein

7. Non fusion of which of the following processes will result in unilateral cleft lip?
 - a. Medial and lateral nasal
 - b. Medial nasal and maxillary**
 - c. Lateral nasal and maxillary
 - d. Maxillary and mandibular
8. Left subclavian artery develops from which of the following?
 - a) Left 7th intersegmental artery**
 - b) 1st arch artery
 - c) 2nd arch artery
 - d) 6th arch artery
9. What is the epithelium of cornea?
 - a) Stratified squamous keratinized
 - b) Stratified squamous non- keratinized**
 - c) Stratified columnar
 - d) Simple columnar
10. Which is not a part of blood air barrier?
 - a) Pneumocyte II**
 - b) Alveolar basal lamina
 - c) Endothelium
 - d) Connective tissue between 2 basal laminae
11. Which muscle takes origin from stylohyoid ligament?
 - a) Superior constrictor
 - b) Middle constrictor**
 - c) Inferior constrictor
 - d) Thyropharyngeus
12. What is the nerve supply of tensor veli palatini?
 - a) Pharyngeal plexus
 - b) Accessory nerve
 - c) Mandibular nerve**
 - d) Maxillary nerve
13. Ligament of Berry is formed by which structure?
 - a) Investing layer of cervical fascia**
 - b) Pretracheal fascia
 - c) Prevertebral fascia
 - d) Buccopharyngeal fascia
14. Which structure is continuous with membrana tectoria?
 - a) Posterior atlanto-occipital membrane
 - b) Anterior atlanto-occipital membrane
 - c) Posterior longitudinal ligament**
 - d) Transverse ligament

15. What is the type of lunate sulcus?
- a) Limiting
 - b) Axial
 - c) **Operculated**
 - d) Complete
16. What is corpus striatum?
- a) **Caudate and lentiform nucleus**
 - b) Caudate nucleus
 - c) Lentiform nucleus
 - d) Globus pallidus and putamen
17. Which of the following areas is not supplied by middle cerebral artery?
- a) **Paracentral lobule**
 - b) Superior temporal gyrus
 - c) Temporal pole
 - d) Lateral part of orbital surface
18. Filum terminale is extension of which structure?
- a) Dura mater
 - b) Central part of cauda equina
 - c) **Pia mater**
 - d) Arachnoid mater
19. How many chromosomes are seen in triploidy?
- a) 46
 - b) 47
 - c) 45
 - d) **69**
20. Which type of inheritance is seen in Hemophilia A?
- a) Autosomal recessive
 - b) Autosomal dominant
 - c) **X linked recessive**
 - d) X linked dominant

Department of Anatomy, MGM Medical College, Navi Mumbai

1st year MBBS

University examination – Paper 1

Duration – 3 Hours (Section A = 30 Minutes, Section B & C = 2 ½ Hours)

INSTRUCTIONS:

- (1) Attempt all questions
- (2) Maximum marks are indicated in the right
- (3) Illustrate the answers with suitable diagrams wherever necessary
- (4) Please surrender your SWITCHED OFF cell phones at entry point into the Examination Hall
- (5) Mobile phones, pagers, blue tooth or any other such communication devices are not allowed in the Examination premises and in the adjacent area

Section B

Q1. Answer any 5

(5X3marks=15 marks)

- a. Name the clinical condition showing flexed wrist with inability to extend. Explain anatomical basis of this condition (2) and name the damaged structure (1).
- b. Discuss cells of anterior pituitary with their staining property and secretions.
- c. List structures contributing to development of interatrial septum. (2) Write anyone developmental anomaly of interatrial septum (1)
- d. What is Barr body? Mention its clinical significance
- e. A 47 years old male with history of liver cirrhosis comes with breathlessness. On radiographic examination there is obliteration of bilateral costophrenic angles.
 - A. What is the condition leading to such radiographic presentation? (1)
 - B. Explain anatomical basis of this radiographic presentation. (2)
- f. During clinical examination of a person, he was unable to hold paper between his last 3 fingers, when examiner tried to pull out the paper. Which are the likely weak muscles being tested? (2). Write their nerve supply. (1)

Q2. Answer any 3

(3X5marks=15 marks)

- A. Which blood vessel is used for BP measurement in arm? (0.5) Name the anatomical space in which this vessel terminally divides and write boundaries of this space (2) Mention extent (0.5) and branches of this vessel (1). Enumerate contents of the above mentioned space with their relation to each other . (1)
- B. List layers seen in microscopic anatomy of cerebellar cortex(1). Describe microscopic structure of its layers with a neat labelled diagram (3). Mention structure and function of Purkinje cell (1)
- C. Justify the following - “Cadaver is our first teacher”
- D. A 59 years old male patient has complaints of breathlessness which increases on lying down. Also there is cough, hoarseness of voice and difficulty in swallowing. He has facial oedema with upper chest showing dilated veins. A. Determine one possible condition which can explain the whole clinical presentation? (1) B. Explain the anatomical basis of

breathlessness, hoarseness of voice, difficulty in swallowing and dilated veins on upper chest based on your understanding of the causative clinical condition. (4)

Q3. Answer any 1

(10 marks)

Which type of joint is shoulder joint? (1) Write its articular surfaces (1). Explain its relations (3). Analyse its movements as per their axis, range and prime movers (3) Explain features and anatomical basis of its any 1 applied aspect (2)

OR

65 years old male has severe chest pain, radiating along left arm, profuse sweating. He is a chronic smoker. He has history of similar but less severe pains felt during exercise over last 6 months. The pain used to ease after rest. His ECG was taken and he was advised angiography.

- Which organ is likely to be involved in this case to cause the given presentation? (1)
- Discuss arterial supply of this organ with neat labelled diagram, under the following headings – Origin (1), Course (2), Branches and Distribution (4) of each artery
- Explain anatomical basis of the above-mentioned clinical presentation. (2)

Section C

Q1. Answer any 5

(5X3marks=15 marks)

- 'Posterior cricoarytenoid muscle is the sole abductor of vocal cord' - Justify the statement on basis of muscle attachments and mechanism of abduction.
- Draw and label microscopic structure of retina
- Explain nerve supply of tongue on its developmental basis
- In case of pulsating exophthalmos with ophthalmoplegia - determine the structure involved and explain clinical features with their anatomical basis
- List various nuclei of spinal cord and explain their location and type based on development
- In case of dilated both lateral and third ventricle, apply your understanding of CSF circulation and decide level of blockage. Write normal CSF circulation as explanation for the same

Q2. Answer any 3

(3X5marks=15 marks)

- Discuss mesodermal derivatives of 1st pharyngeal arch
- Describe Turner syndrome as its genotype, phenotype and causes.
- Discuss formation, extent and contents of carotid sheath with mention of any one applied aspect
- A patient comes with left side hemiplegia and ptosis on right side, lateral squint, dilated fixed pupil. Analyse the features and answer following - what clinical condition can explain all features? (1) Discuss its cause (1) and anatomical basis for all features.(3)

Q3. Answer any 1

(10 marks)

Describe gross features and relations of the parotid gland (5) Explain its nerve supply (2) In patient with complaints of sweating on face while eating - determine the possible clinical condition and explain its anatomical basis (3)

OR

Classify white matter of cerebrum with examples. (2) Describe Parts of internal capsule with their relations (3). If hypertensive patient comes with right side hemiplegia and loss of sensations - determine which part of the capsule is involved with its anatomical basis. (2) Discuss blood supply and fibres passing through different parts of internal capsule (3)

1st MBBS - Anatomy Model Question Paper 1 – Blue Print Analysis

Question	Level	Topic								Total no. of questions	Total Marks
		UL	Thorax	HFN	Neuro	SH	SE	Genetics	AETCOM		
MCQs		1,2,3	4,5,6	11,12 13,14	15,16, 17,18	9,10	7,8	19,20		20	20
Q. 1. BAQ 5 out of 6 Each FOR Sections B & C	K				C-1e		B-1c	B-1d		3	9
	C					B-1b, C-1b	C-1c			3	9
	Ap	B-1a			C-1f					2	6
	An	B-1f	B-1e							2	6
	E			C-1a						1	3
	S			C-1d						1	3
Q. 2. SAQ 3 out of 4 Each FOR Sections B & C	K					B-2b		C-2b		2	10
	C			C-2c			C-2a			2	10
	Ap	B-2a								1	5
	An				C-2d					1	5
	E							B-2c		1	5
	S		B-2d							1	5
Q. 3. LAQ 1 out of 2 Each FOR Sections B & C	K, C An	B-3a									10
	K, C An		B-3b								
	K, C E			C-3a							10
	K, C An, S				C-3b						
MCQs - 20		3	3	4	4	2	2	2		20	20/20
BAQ - Any 10		2	1	2	2	2	2	1		12	30/36
SAQ - Any 6		1	1	1	1	1	1	1	1	8	30/40
LAQ - Any 2		1	1	1	1					4	20/40

Department of Anatomy, MGM Medical College, Navi Mumbai

1st year MBBS

University Examination – Paper 2

INSTRUCTIONS

5. Attempt all questions
 6. Maximum marks are indicated in the right
 7. Illustrate the answers with suitable diagrams wherever necessary
 8. Mobile phones, pagers, bluetooth or any others such communication devices are not allowed in examination premises and in the adjacent area.
-

Section A

(20X1mark = 20 marks)

1. Which of the following is a bipennate muscle?
 - a) Tibialis anterior
 - b) Peroneus tertius
 - c) Extensor digitorum longus
 - d) **Rectus femoris**
2. What is the type of talo-calcaneo-navicular joint?
 - a) Saddle
 - b) Pivot
 - c) **Ball & socket**
 - d) Condylar
3. Which of the following is not supplied by superior gluteal nerve?
 - a) Tensor fascia lata
 - b) Gluteus medius
 - c) Gluteus minimus
 - d) **Piriformis**
4. What is the position of foot in clinical condition due to injury to common peroneal nerve at the neck of fibula?
 - a) Plantar flexed and inverted
 - b) **Only plantar flexed**
 - c) dorsiflexed and inverted
 - d) Plantar flexed and enverted
5. Gastric glands are derived from which of the following structure?
 - a) Ectoderm
 - b) Splanchnopleuric mesoderm
 - c) Somatopleuric mesoderm
 - d) **Endoderm**
6. Which is not a derivative of neural crest cell?
 - a) Pigment cell
 - b) Schwann cell
 - c) **Astrocyte**
 - d) Pia mater

7. Passage of sperms towards tubal ampulla around ovulation time is not helped by which of the following?
 - a) Muscular contraction of uterus
 - b) Prostaglandins
 - c) **Thick, copious cervical mucus**
 - d) Sperm motility
8. Which one of the following is not a derivative of foregut?
 - a) Liver
 - b) **Spleen**
 - c) Pancreas
 - d) Gall bladder
9. Which is the most common position of appendix?
 - a) Pelvic
 - b) Subcaecal
 - c) **Retrocaecal**
 - d) Splenic
10. Duodenum is identified histologically by the presence of which structure?
 - a) Parietal cells
 - b) Serous acini
 - c) **Brunner's glands**
 - d) Stratified squamous epithelium
11. Which is not the content of ischio-anal fossa?
 - a) Inferior rectal nerve and vessels
 - b) Pudendal nerve and internal pudendal vessels
 - c) **Middle rectal vessels**
 - d) Ischio-anal pad of fat
12. Which is narrowest part of male urethra?
 - a) Prostatic
 - b) **Membranous**
 - c) Preprostatic
 - d) Penile
13. Ovarian vein opens in which vein on left side?
 - a) Inferior vena cava
 - b) **Renal vein**
 - c) External iliac vein
 - d) Internal iliac vein
14. Inferior rectal artery is a branch of which artery?
 - a) Internal iliac artery
 - b) Inferior mesenteric
 - c) **Internal pudendal**
 - d) Superior mesenteric
15. What is the epithelium of vas deferens?

- a) Simple columnar
 - b) Stratified columnar
 - c) **Pseudostratified columnar**
 - d) Tall columnar
16. Which of the following forms posterior wall of rectus sheath below arcuate line?
- a) Internal oblique aponeurosis
 - b) Transversus abdominis
 - c) **Fascia transversalis**
 - d) All three flat muscles of abdominal wall
17. Which cells secrete components of the matrix?
- a) **Osteoblast**
 - b) Osteoclast
 - c) Osteocyte
 - d) Osteogenic cells
18. Which junction is needed for ion transport and synchronous function of group of cells?
- a) **Gap**
 - b) Tight
 - c) Adhesive
 - d) Anchoring
19. Which of the following structure is not seen in porta hepatis?
- a) Hepatic artery
 - b) **Hepatic vein**
 - c) Portal vein
 - d) Hepatic duct
20. Which is unpaired branch of abdominal aorta?
- a) Gonadal artery
 - b) **Superior mesenteric artery**
 - c) Inferior phrenic artery
 - d) Middle suprarenal artery

Department of Anatomy, MGM Medical College, Navi Mumbai
1st year MBBS

University examination – Paper 2

Duration – 3 Hours (Section A = 30 Minutes, Section B & C = 2 ½ Hours)

INSTRUCTIONS:

- (1) Attempt all questions
 - (2) Maximum marks are indicated in the right
 - (3) Illustrate the answers with suitable diagrams wherever necessary
 - (4) Please surrender your SWITCHED OFF cell phones at entry point into the Examination Hall
 - (5) Mobile phones, pagers, blue tooth or any other such communication devices are not allowed in the Examination premises and in the adjacent area
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Section B

Q1. Answer any 5

(5X3marks=15 marks)

- a. Write similarities and differences between 2 menisci and with application of this knowledge explain 'Medial meniscus is more prone to injuries'
- b. Compare between small and large intestine
- c. Draw and label microscopic structure of liver
- d. List types of neuroglial cells with 1 function of each
- e. What is implantation? Discuss sites and causes of abnormal implantation
- f. Illustrate similarities and differences between anterior relations of both kidneys with neat labelled diagrams

Q2. Answer any 3

(3X5marks=15 marks)

- A. 50-year-old policeman has dull ache in both legs with enlarged twisted and tortuous structures seen on the medial side of his both legs and right thigh. A. Name the described clinical condition. (1) B. Describe the extent and course of the involved structure in this case? (2) C. Explain possible causes and their anatomical basis which usually lead to this clinical condition. (2)
- B. Discuss similarities and differences between microscopic structure of Cardiac and skeletal muscle with diagram
- C. What is primitive Streak? Write its formation, parts, functions and applied anatomy
- D. A 55 years old multiparous female comes with complaints of mass felt to come out per vaginum especially during straining. A. Determine the possible condition which can explain the clinical presentation? (1) B. Explain the anatomical basis of these clinical features. (2).Discuss any 3 important structures which normally prevent occurrence of this clinical condition (2)

Q3. Answer any 1**(10 marks)**

Classify the arches of foot (2) Explain their Formation (3) Discuss factors maintaining arches (3)
Explain features and anatomical basis of its any 1 applied aspect (2)

OR

Describe gross external & internal features of the urinary bladder (4) Specify its ligaments (2)
In case of discharge of urine at umbilicus - determine a congenital condition and discuss development of bladder with basis for this presentation

Section C**Q1. Answer any 5****(5X3marks =15 marks)**

- a. A 12-year-old boy, following a painful intramuscular injection in the left gluteal region developed severe pain and weakness of left lower limb with foot drop
Name the structure which is affected in this case. (1) What is the anatomical basis for the clinical presentation? (2)
- b. Compare parts of anal canal above and below pectinate line
- c. 45 years old alcoholic male came to hospital with complaints of blood in vomiting and dilated tortuous linear swellings radiating from umbilicus.
 - A. Name both the clinical presentations (1)
 - B. Determine the common clinical basis leading to them both (1)
 - C. Explain anatomical basis of any one of them. (1)
- d. List derivatives of mesonephric duct in male and female
- e. Discuss similarities and differences in microscopic structure of hyaline and elastic cartilage with examples
- f. Specify boundaries of femoral canal and apply this to knowledge to explain basis of course of femoral hernia

Q2. Answer any 3**(3X5marks=15 marks)**

- A. A 35 year old male comes with history of infertility. He has dilated tortuous swellings on his testes. Decide what is this clinical condition based on given features. (1). Describe relevant anatomy (1) and explain anatomical basis of this condition (3)
- B. Describe microscopic structure of Testis with development, structure and function of any of its 2 cells (3+2)
- C. What is epiphysis? (1) Discuss types of epiphyses with examples. (3) State law of epiphyseal fusion (1)
- D. A 35 year old female corporate employee comes with complaints of severe burning epigastric pain, bloating and vomiting. She is advised endoscopic examination of her upper GIT.

Analyse the clinical features & determine the affected organ with name of the clinical condition. (1) Discuss arterial supply of the affected organ (2). Explain basis of commonest site in the organ for this clinical condition with respect to its arterial supply (2)

Q3. Answer any 1

(10 marks)

What are boundaries of inguinal canal (3). Discuss its contents in male and female (3) Compare similarities and differences between direct and indirect inguinal hernia (4)

OR

Describe gross features and duct system of the pancreas (3) Specify its blood supply with neat labelled diagram (3).

In case of duodenal and bile duct obstruction - determine a congenital reason and discuss development of pancreas with basis for this presentation (4)

Question	Level	Topics								Total no. of questions	Total Marks
		LL	Abdo	Pelvis	SH	SE	GA	GH	GE		
MCQs		3,4	9,16,19,20	11,12,13,14	10,15	5,8	1,2	17,18	6,7	20	20
Q. 1. BAQ 5 out of 6 Each FOR Sections B & C	K				B-1c	C-1d	B-1d			3	9
	C		B-1f					C-1e	B-1e	3	9
	Ap	B-1a, C-1f								2	6
	An		B-1b	C-1b						2	6
	E	C-1a								1	3
	S		C-1c							1	3
Q. 2. SAQ 3 out of 4 Each FOR Sections B & C	K				C-2b				B-2c	2	10
	C						C-2c	B-2b		2	10
	Ap	B-2a								1	5
	An		C-2d							1	5
	E		C-2a							1	5
	S			B-2d						1	5
Q. 3. LAQ 1 out of 2 Each FOR Sections B & C	K, C An	B-3a								10	
	K, C An, E			B-3b							
	An		C-3a							10	
	K, C An		C-3a								
MCQs - 20		2	4	4	2	2	2	2	2	20	20
BAQ - Any 10		3	3	1	1	1	1	1	1	12	30 /36
SAQ - Any 6		1	2	1	1		1	1	1	8	30 /40
LAQ - Any 2		1	2	1						4	20 /40

Resolution No. 3.6 of Academic Council (AC-42/2022): Resolved to continue the existing method for additional exam for 1st MBBS (CBME) as per guidelines given by NMC in First MBBS Anatomy/ Physiology/Biochemistry for theory/Practical.

Resolution No. 3.19 of Academic Council (AC-42/2022): It is resolved to approve all the suggestions given by NMC Undergraduate board as per NMC Notification dated 31.03.2022 related to First MBBS Anatomy/Physiology/Biochemistry except Point No. 7 in relation to Oath ceremony, with effect from the batch admitted in academic year 21-22. [ANNEXURE- 16]

Annex-15 of AC-42/2022

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राष्ट्रीय आयुर्विज्ञान आयोग

ANNEX-15

National Medical Commission
(Undergraduate Medical Education Board)

No. U.11026/1/2022-UGMEB

Dated the 31st March, 2022

Circular

Subject : Implementation of new Competency Based Medical Education for Undergraduate Course Curriculum.

The new Competency Based Medical Education for Undergraduate Course Curriculum was discussed in detail in the 6th meeting of National Medical Commission, which was held on 24th March, 2022 at New Delhi.

2. After detailed discussion and deliberation, it has been unanimously decided in the said meeting of the Commission to implement new Competency Based Medical Education for Undergraduate Course Curriculum from the current batch of MBBS students i.e. 2021-22, admitted in the month Feb-March 2022.

3. The new Competency Based Medical Education for Undergraduate Course Curriculum would be implemented with the objective of covering all three domains of learning (Cognitive, Affective & Psychomotor). The new course curriculum introduced in August 2019 enriches the medical student with a sound base and balanced approach to overall aspect with the introduction of foundation course which includes Family Adoption Programme, Yoga, meditation, Local Language adaptation and skills.

4. All State Governments/UTs, universities and medical colleges/institutes are requested to take immediate necessary steps to implement the new Competency Based Medical Education for Undergraduate Course Curriculum from the current batch of MBBS students i.e. 2021-22, admitted in the month Feb-March 2022.

Shamhore

(Dr. Aruna V. Vanikar)
President

Encl:

- (i) Guidelines for implementation of new CBME Course curriculum.
- (ii) Academic Calendar for MBBS Batch
- (iii) Month-wise schedule of new CBME Course
- (iv) Curriculum for Family Adoption Programme
- (v) Brief modified transliteration of Maharshi Charak Shapth

Guidelines for implementation of new CBME Course curriculum for MBBS
batch 2021-22 admitted in Feb-March 2022

1. The said guidelines are for the UG CBME **2021 (admitted in 2022)** batch.
2. The curriculum of UG CBME 2021 will begin from **14th Feb 2022** in all medical colleges across the country. The basic framework and inclusions of CBME will not be disturbed as they are vital components of outcome-based education. It is mainly the **redistribution of hours** in view of COVID-19 pandemic within the time frame that needs consideration for 2021-'22 (admitted in Feb. 2022) batch.
3. Redistribution with timeline of professional years for 2021-'22 (admitted in Feb. 2022) is provided in slides herewith.
Since the duration for 1st professional has been reduced from 14 months to 12 months, the period can be adjusted by :
 - a. Having one week of Foundation Course at the beginning of the academic calendar and then spreading remaining three weeks of Foundation Course in first six months beyond curricular hours
 - b. Allocating Sports & Extracurricular hours for regular teaching
 - c. Reducing duration of vacation (1 week in Summer & 1 week in Winter, at the discretion of University and college)
 - d. Final, 1st exams will be for Forensic Medicine, Toxicology and Community Medicine
 - e. All clinical subjects will be taught as per curriculum parallel and exams will be covered under NEXT.
4. **Early clinical exposure and Integration** retained since they are all teaching-learning methods/strategies for addressing identified competencies.

5. **Self directed learning (SDL):** Some SDL hours can be reduced, specifically from Phase-I subjects like Anatomy (there are 40 hours), Physiology (20 hours). Some SDL hours can go beyond office hours if required (as such also students may be required to do certain things for SDL beyond regular hours).

6. **Electives** promote academic flexibility and may be offered onsite based on student's need and choice. One month of Electives (Block A & B, 15 days each) can be adjusted for this batch, wherein Block A (pre/para clinical electives) can have electives along with clinical postings and Block B (clinical electives) without clinical posting.

7. **Family adoption** program is recommended as a part of curriculum of Community Medicine and should begin from 1st professional year and remain throughout the curriculum. The orientation towards the same may be a part of foundation course under the theme of 'Field visit to community health centre' (8 hrs) which is already allocated to foundation course in GMER 2019.

The family adoption shall include villages not covered under PHC adopted by medical college, and if travel time from college to site is more than 2 hours on week-ends, in such situation, bastis / jhuggis/ towns or on outskirts of cities may be adopted.

7. Modified 'Maharshi CharakShapath' is recommended when a candidate is introduced to medical education.

8. Yoga training is recommended to be initiated during foundation course, (1 hour, preferably in the morning in orientation week). Yoga practices shall be for maximum 1 hour every day during the period of 10 days beginning from 12th June every year to be culminated on International Yoga day, i.e. 21st June, to be celebrated in all medical schools across the country. These may be practiced by all batches of MBBS. Yoga module will be made available to all

colleges by UGMEB- NMC. However colleges may adopt their own modules. Yoga unit may be inducted under PMR department or any other department of all colleges at their discretion.

9. **Assessment:** A robust continuous formative and internal assessment is required to ensure competencies and thereby a competent medical graduate. If required, we can have two internal assessments and the third internal assessment can be calculated from various unitary and continuous tests taken throughout the year.

10: **Supplementary examinations:** Supplementary exam be conducted between 4 to 6 weeks from the date of declaration of results of regular university examinations. The result of Supplementary examinations be declared within 10 days from the date of completion of examinations.

11. There shall be no supplementary/ repeater batch. For students who fail in their university examination:

- Students who pass in 1st MBBS supplementary examination shall be offered special classes and ward postings to cover up the syllabus, so that he/she copes up with subjects. Subsequently (after passing in supplementary examination) the student shall continue with his/her regular batch. Attendance of special classes/ postings for such students shall be counted. Students who fail to pass in supplementary examination, shall be joining the subsequent junior batch.

- Students who pass in 2nd MBBS supplementary examination shall be offered special classes and ward postings to cover up the syllabus, so that he/she copes up with subjects. The student shall not join classes of the Final MBBS till he/she is given a chance of passing in first supplementary examination. He/she shall continue with his regular batch after passing in supplementary examination of 2nd MBBS.

Attendance of special classes/ postings be counted. Students who fail to pass in supplementary examination of 2nd MBBS may be allowed to continue with his/her regular batch. However the student shall have to pass 2nd MBBS before taking up Final MBBS examination, as per the existing guidelines.

12. Details and guidelines on NEXT examination shall be notified by NMC.

ACADEMIC CALENDER FOR MBBS BATCH(2021-22) ADMITTED IN FEB-MAR 2022

Professional year	Time frame	Months available (Teaching + Exam)	Comparison with GMER 2019
1 st	14 th Feb '22 to 31 st Jan '23, Exam - Feb.	11.5 months (incl. F.C.) Exam , Result = 1 month	14 months (incl. one month FC)
2 nd	1 st March,'23 to 29 th Feb,'24 Exam- March, '24	12 months Exam , Result = 1 month	12 months
3 rd (III-part-1)	1 st April,'24 to 15 th Jan,'25, Exam – till 31 th Jan, '25	9.5 months Exam - 15 days (FMT, Community Med)	13 months
Electives + results	Block A–(first half) Feb, '25 Block B–(second half) Feb, '25	1 month	2 months
4 th (III-part-2)	1 st March,'25 to 31 st March, '26	13 months NeXT (theory) – April, '26 Univ. (practical) – April, '26	13 months
Internship	1 st May, '26 to 30 th April '27,	12 months	12 months
NeXT & Counselling	May, June, '27	Counselling before 15 th June	1 month
PG	July, '27		

MONTH-WISE SCHEDULE FOR NEW CBME COURSE FOR MBBS BATCH 2021-22 JOINED IN FEB-MAR 2022

MBBS	1	2	3	4	5	6	7	8	9	10	11	12
2022	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	months	14 TH -1	2	3	4	5	6	7	8	9	10	11
2023	12	Exam, Results	2 ND PROF-1	2	3	4	5	6	7	8	9	10
2024	11	12	Exam, Results	3 RD 1 ST -1	2	3	4	5	6	7	8	9
2025	10- exam in 2 nd half	11-Electives	12	13	14	15	16	17	18	19	20	21
2026	22	23	24	25- NEXT & Univ. final practical, Results	INTERNS HIP- 1	2	3	4	5	6	7	8
2027	9	10	11	12	NEXT, counsell ng	couns elling	PG					

CURRICULUM FOR FAMILY ADOPTION PROGRAMME

Need of the Program:

In India, around 65.5 % of population resides in rural settings (as per 2020 statistics) whereas availability of health care facilities and services are skewed towards urban set ups. Though adequate healthcare supplies exist in the community, it is the access to healthcare to a rural citizen that is a major concern. Issues like health illiteracy, ignorance about communicable and non communicable diseases, means to reach health care facility, services, take time off from their daily wages work and workforce shortages are some of the barriers that limits timely and quality health related awareness and care leading to a scenario of 'Scarcity in abundance'. Hence there is a need to take measures to make healthcare more accessible to the rural and needy population and impart community based and community oriented training to budding healthcare professionals.

Aim:

Family adoption program aims to provide an experiential learning opportunity to Indian Medical graduates towards community based health care and thereby enhance equity in health.

Objectives of the Program:

During the Medical UG training program, the learner should be able to :

1. Orient the learner towards primary health care
2. Create health related awareness within the community
3. Function as a first point of contact for any health issues within the community
4. Act as a conduit between the population and relevant health care facility
5. Generate and analyse related data for improving health outcomes and Evidence based clinical practices.

Specifics of the Program:

Family adoption program is recommended as a part of curriculum of Community Medicine and should begin from 1st professional year with competencies being spread in ascending manner for entire MBBS training program. The orientation towards the same may be a part of Foundation course under the theme of 'Field visit to community health centre' (8 hrs) which is already allocated to foundation course as per GMER 2019.

The family adoption shall preferably include villages not covered under PHCs adopted by medical college. If transit time from college to site is more than 2 hours, then bastis / jhuggis/ towns on outskirts of cities may be considered for family adoption. Medical students may be divided into teams and each team may be allocated visits, with 5 families per student. These families may be introduced during their first visit; however, the model may be flexible depending upon the number of students and available families for adoption. The entire team should work under a mentor teacher for entire part of the training program.

Other considerations:

Every college may arrange one diagnostic medical camp in the village wherein identification of: anemia, malnutrition in children, hypertension, diabetes mellitus, ischemic heart diseases, kidney diseases, any other local problems may be addressed.

If required, patients shall be admitted in the hospital for acute illness under care of student, charges may be waived off or provide concession or govt. schemes.

For chronic illness, students shall be involved.

Subsidized treatment charges may be provided under govt. schemes or welfare schemes.

Camps may be arranged by Dean and Community Medicine/ P.S.M. department with active involvement of Associate/ Asst. Professors, social worker and supporting staff. Local population may be involved with village leaders.

Visit by students be made to the visit as mentioned in table below. Annual follow up diagnostic camp can be continued by the PSM department. As a step towards environment consciousness, students may be encouraged for tree plantation/medicinal plants around beginning of monsoons, in the environs of the families adopted. This could be also included in the environs of the hostels/ residence of students wherever possible.

At the end of the programme, students may be envisioned to become leaders for the community.

TARGETS TO BE ACHIEVED BY STUDENTS:

First Professional Year:

- Learning communication skills and inspire confidence amongst families
- Understand the dynamics of rural set-up of that region
- Screening programs and education about ongoing government sponsored health related programs
- Learn to analyse the data collected from their families
- Identify diseases/ ill-health/ malnutrition of allotted families and try to improve the standards

2nd Professional Year

- Inspire active participation of community through families allotted
- Continue active involvement to become the first doctor /reference point of the family by continued active interaction
- Start compiling the outcome targets achieved

3rd Professional Year

- Analysis of their involvement and impact on existing socio-politico-economic dynamics in addition to improvement in health conditions
- Final visit in the last months in advance to examination schedule, to have last round of active interaction with families**

-prepare a report to be submitted to department addressing:

- 1) Improvement in general health
- 2) Immunization
- 3) Sanitation
- 4) De-addiction
- 5) Improvement in anemia, tuberculosis control
- 6) Sanitation awareness
- 7) Any other issues
- 8) Role of the student in supporting family during illness/ medical emergency
- 9) Social responsibility in the form of environment protection programme in form of plantation drive (medicinal plants/trees), cleanliness and sanitation drives with the initiative of the medical student

Professional Year	Competency The student should be able to	Objectives	Suggested Teaching Learning methods	Suggested Assessment methods	Teaching Hours
1 st Professional	<ul style="list-style-type: none"> Collect demographic profile of allotted families, take history and conduct clinical examination of all family members 	By the end of this visit, students should be able to compile the basic demographic profile of allocated family members	Family survey, Community clinics, Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	6 hrs
	<ul style="list-style-type: none"> Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor 	By the end of this visit, students should be able to report the basic health profile and treatment history of allocated family members	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook, journal of visit	9 hrs
	<ul style="list-style-type: none"> Maintain communication & follow up of remedial measures 	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment and suggested remedial measures	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	Community case presentation, OSPE, logbook based certification of competency, journal of visit	6 hrs
	<ul style="list-style-type: none"> Take part in environment protection and sustenance activities. 	By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance			6hrs

		like study of environment of families, tree plantation/ herbal plantation activities conducted in the village		logbook based certification of competency, journal of visit	(Total 27 hrs, 9 visits)
2 nd Professional	<ul style="list-style-type: none"> Take history and conduct clinical examination of all family members 	By the end of this visit, students should be able to compile the updated medical history of family members and report their vitals and anthropometry	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	6 hrs
	<ul style="list-style-type: none"> Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor 	By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine routine and blood sugar along with treatment history of allocated family members	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	9 hrs
	<ul style="list-style-type: none"> Maintain communication & follow up of remedial measures 	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency,	9 hrs

	<ul style="list-style-type: none"> Take part in environment protection and sustenance activities. 	<p>measures along with details of vaccination drive</p> <p>By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenancelike study of environment of families, tree plantation/ herbal plantation activities conducted in the village</p>	<p>Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences</p>	<p>journal of visit</p> <p>logbook based certification of competency, journal of visit</p>	<p>6 hrs</p> <p>(Total 30 hrs, 6 visits)</p>
3 rd Professional	<ul style="list-style-type: none"> Final counselling of the family members of allotted families and analyze the health trajectory of adopted family under overall guidance of mentor 	<p>By the end of this visit, students should be able to update the medical history of family members and their vitals and anthropometry</p> <p>By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine routine and blood sugar along with treatment history of allocated family members</p>	<p>Family survey, Community clinics</p> <p>Community clinics, Multispecialty camps</p>	<p>Community case presentation, OSPE, logbook, journal of visit</p> <p>Community case presentation, OSPE, logbook, journal of visit</p>	<p>3hrs</p> <p>4 hrs</p>

		<p>By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive</p>	<p>Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,</p>	<p>Community case presentation, OSPE, logbook based certification of competency, journal of visit</p>	<p>4 hrs</p>
		<p>- By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village</p>	<p>Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences</p>	<p>logbook based certification of competency, journal of visit</p>	<p>4 hrs</p>
		<p>By the last visit, students should be able to analyze and report the health trajectory of adopted family along with remedial measures adopted at individual, family and community level</p>	<p>- Small group discussion (report of the health trajectory of adopted family)</p>	<p>-Logbook based certification of competency, journal of visit</p>	<p>+6 hrs in last visit (total 21 hrs, 5 visits)</p>

TOTAL	1 st Prof 2 nd Prof 3 rd Prof	9 visits 6 visits <u>5 visits</u> 20 visits	27 hrs 30 hrs 16 hrs +5 hours in <u>last visit</u> 78 hrs		
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PROTO-TYPE LOG BOOK FOR FAMILY ADOPTION

COLLEGE NAME, UNIVERSITY

ADDRESS DETAILS

NAME OF THE STUDENT:

ROLL NO.:

VILLAGE NAME:

TEHSIL/ DISTRICT:

STATE/ UNION TERRITORY:

NAME OF THE MENTOR:

MENTOR STATUS: Asst. Prof/ S.R. And Details: (If changed, details of subsequent mentors)

NAME OF ASHA WORKER:

ADDRESS OF ASHA WORKER:

EXPERIENCE (SINCE HOW MANY YEARS IS HE/ SHE EMPLOYED)

(SEPARATE PAGE FOR EACH FAMILY BE MAINTAINED)

-FAMILY NAME AND ADDRESS

- Approximate size of living space of house-hold

- Malaria/ flu/ etc pertinent to the region

- If there is any illness or medical emergency required by the house-hold, the student should take initiative in being the primarycontact for the family.
- The student in turn should consult his/her mentor for further management of the patient.
- The hospital to which the college is attached must provide treatment facilities to the patient.
- Government schemes may be utilized for optimal management.
- Follow-up records must be maintained by the student. These must be periodically evaluated by mentors with the help of senior residents.
- The entire data sheet may be prepared by every student and submitted latest by the end of the last visit for evaluation.
- Progress notes must include every demographic point and history recorded.

PROTO TYPE LOG BOOK

NAME	AADHAAR NO.	BIRTH DATE	AGE	POSITION IN FAMILY	DIETARY HABITS, DIET	LITERACY: EDUCATIONAL QUALIFICATION	EMPLOYMENT for income source, eg. Labourer/ land owner/ teacher, etc	NAME OF SCHOOL OF CHILD	ADDICTIONS IF ANY	HEIGHT (CMS)	WEIGHT (KG)
				(eg. Head, wife, sibling order, grand mother, etc)		annual progress of children to be recorded		grade/ standard, medium of learning			

1ST PROF/
MBBS

SR. NO. DATE OF VISIT

1

2

2ND
MBBS

1

2

FINAL-1ST
PROF-
FINAL
MBBS-1ST

1

2

PROTO TYPE LOG B

IMMUNIZATI						HEMOGLOBI	URINE	URINE	ANY	BLOOD	IMMUNIZATION	ORAL	
ON STATUS	PULSE	BP	R.R.	BLD GP, Rh	N		PROTEIN	SUGAR	G IN URINE	SUGAR	STATUS	CHECK-UP	HYGEINE STATUS

1ST PROF/
MBBS

SR. NO.	DATE OF VISIT
1	
2	

2ND
MBBS

1
2

FINAL-1ST
PROF-
FINAL
MBBS-1ST

1
2

BRIEF TRANSLITERATION OF MAHARSHI CHARAK SHAPATH

- ❖ During the period of study I shall live a disciplined life with my teachers and peers. My action shall be guarded, service oriented and free from indiscipline and envy. In my dealings I shall be patient, obedient, humble, constantly contemplative and calm. I shall aim my full efforts and ability towards the desired goal of my profession.
 - ❖ As a Physician, I shall always use my knowledge for welfare of mankind.
 - ❖ I shall always be ready to serve patients, even if I am extremely busy and tired. I shall not harm any patient for the sake of monetary or selfish gains, nor shall I entertain a desire for lust, greed or wealth. Immorality shall not emerge even in my thoughts.
 - ❖ My dressing shall be decent yet impressive and inspiring confidence. My conduct shall always be appropriate, pleasant, truthful, beneficial and polite. I shall use my experience in actions appropriate for that time and place.
 - ❖ I shall constantly endeavor to accomplish/ keep updated with the latest developments in the field and widen my knowledge.
 - ❖ I shall treat patient of gender other than mine in presence of relatives or attendants.
 - ❖ When examining a patient, my discretion, attention and senses shall be concentrated on the cure of the disease. I shall not divulge the confidentiality related to the patient or family inappropriately.
 - ❖ Although an authority (in my subject), I shall not display my knowledge and skill with arrogance.
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MGMIHS, Navi Mumbai

Alignment Integration topics **Module**

**Common list of AITo
of
Department of Anatomy / Physiology / Biochemistry**

(as per CBME syllabus)



MGMIHS, Navi Mumbai
DEPT.OF ANATOMY

Annexure No. 4

Common List of Alignment and integration topics

Sr. No.	Compe- tency No.	Competency	Teaching & Learning Method	No. of Hrs.	Vertical Integration with	Horizontal Integration with
1	AN 61.3	Describe anatomical basis and effects of Benedikt's and Weber's syndrome	Lecture,	2	Gen Medicine	
2	AN 62.6	Describe and identify formation, branches and major areas of distribution of circle of Willis	Practical, Lecture, small group discussion, DOAP session	3	Gen. medicine	
3	AN 62.2	Describe and demonstrate surfaces, sulci, gyri, poles and functional areas of cerebral hemisphere	Practical, Lecture, small group discussion, DOAP session	4	Gen. Medicine	
4	AN 62.3	Describe the white matter of cerebrum	Lecture,	3	Gen. Medicine	
5	AN36.5	Describe the clinical significance of Killian's dehiscence	Lecture,	3	ENT	
6	AN37.1, 37.2, 37.3	Describe and demonstrate features of nasal septum, lateral wall of nose and their blood supply and nerve supply Describe location and functional anatomy of paranasal sinuses Describe anatomical basis of sinusitis and maxillary sinus tumors.	Practical, Lecture, small group discussion, DOAP session	5	ENT	
7	AN 74.1, 74.2, 74.3, 74.4	Describe the various modes of inheritance with examples Draw pedigree charts for the various types of inheritance and give examples of diseases of each mode of inheritances Describe multifactorial inheritance with examples Describe the genetic basis and clinical features of Achondroplasia, Cystic fibrosis,	Lecture	8	Gen. Medicine	

		Vitamin D resistance rickets, Haemophilia, Dushene's muscular dystrophy and sickle cell anaemia				
8	AN 75.1	Describe the structural and numerical chromosomal aberrations	Lecture,	3	Pediatrics	
9	AN 38.1, 38.2, 38.3	Describe the morphology, identify structure of the wall, nerve supply, blood supply and actions of intrinsic and extrinsic muscle of larynx.	Practical, Lecture, small group discussion, DOAP session	4	ENT	
10	AN 75.3	Describe the genetic basis and clinical features of Prader Will syndrome, Edward syndrome and Patau syndrome	Lecture	1	Pediatrics	
11	AN 40.1, 40.2, 40.3	Describe and identify the parts, blood supply and nerve supply of external ear. Describe and demonstrate the boundaries, contents, relations and functional anatomy of middle ear and auditory tube. Describe the features of internal ear	Practical, Lecture, small group discussion, DOAP session	4	ENT	
12	AN 40.4, 40.5	Explain anatomical basis of otitis externa and otitis media Explain anatomical basis of myringotomy	Lecture,	1	ENT	
13	AN 35.5, 35.9	Describe and demonstrate extent, drainage and applied anatomy of cervical lymph nodes Describe clinical features of compression of subclavian artery and lower trunk of brachial plexus by cervical rib	Practical, Lecture, small group discussion, DOAP session	4	Gen Surgery	
14	AN 31.3	Describe anatomical basis of Horner's syndrome	Practical,	1	Ophthalmology	
15	AN 64.3	Describe various types of open neural tube defects with its embryological basis	Lecture,	3	OBGY and Pediatrics	
16	AN 29.3	Explain anatomical basis of wry neck	Lecture,	1	General Surgery	
17	AN 27.1	Describe anatomical basis of congenital hydrocephalus	Lecture, practical	3	Pediatrics	
18	AN 39.2	Explain the anatomical basis of hypoglossal nerve	Lecture,	1	ENT	
19	AN 60.3	Describe anatomical basis of cerebellar dysfunction	Lecture,	3	Gen Medicine	Physiology
20	AN 36.1, 36.2,	Describe the morphology, relations, blood supply and applied	Lecture,	6	ENT	

	36.3, 36.4	anatomy of palatine tonsil and composition of soft palate. Describe the components and functions of Waldeyer's lymphatic ring. Describe the boundaries and clinical significance of pyriform fossa Describe the anatomical basis of tonsillitis, tonsillectomy, adenoids and peritonsillar abscess				
21	AN 33.2	Describe and demonstrate attachments, direction of fibres, nerve supply and actions of muscles of mastication	Practical, Lecture, small group discussion, DOAP session	3	Gen. Surgery	
22	AN 52.5	Describe the development and congenital anomalies of diaphragm	Lecture,	2	General Surgery	
23	AN 33.4, 33.5	Explain the clinical significance of pterygoid venous plexus Describe the features of dislocation of temporomandibular joint	Lecture,	2	Gen. Surgery	-----
24	AN 28.9, 28.10	Describe and demonstrate the parts, borders, surfaces, contents, relations and nerve supply of parotid gland with course of its duct and surgical importance. Explain the anatomical basis of Fre s syndrome	Practical, Lecture, small group discussion, DOAP session	3	General Surgery	
25	AN 25.4, 25.5	Formation and folding of heart tube, Inter atrial septum, Inter ventricular septum and TA with anomalies	Lecture, small group discussion,	8	Gen. Medicine and pediatrics	
26	AN 19.6, 19.7	Anatomical basis of flat foot and club foot Metatarsalgia and plantar fasciitis.	Lecture,	2	Orthopaedic s	-----
27	AN 19.3, 19.4	Concept of peripheral heart Explain anatomical basis of rupture of tendoachilles	Lecture,	2	Gen Surgery Orthopaedic s	
28	AN 20.6	Identify bones and joints of lower extremity in x ray with AP and Lateral veiw	Lecture, small group discussion, DOAP session	3	Radio diagnosis	
29	AN 27.1	Describe layers of scalp, its blood supply, nerve supply and surgical importance	Practical, Lecture	3	General surgery	

30	AN 35.2, 35.5	Describe location, parts, borders, surfaces, relations and blood supply of thyroid. Describe extent, drainage and applied anatomy of cervical lymph nodes	Practical, Lecture, small group discussion, DOAP session	7	General Surgery	
31	AN 28.8	Explain surgical importance of deep facial vein	Lecture	1	Gen Surgery	
32	AN 34.1, 43.5	Describe morphology relations and nerve supply of submandibular salivary gland and submandibular ganglion. Testing muscle of facial expression	Practical, Lecture, small group discussion, DOAP session	5	General Surgery	
33	AN56.1 , 56.2	Describe and identify various layers of meninges and its extent and modification. Describe circulation of CSF with its clinical importance	Practical, Lecture, small group discussion, DOAP session	4	Gen. Medicine	
34	AN 25.3	Describe foetal circulation and changes occurring at birth	Lecture, small group disussion	3	Gen. Medicine	
35	AN 30.1, 30.2	Describe cranial fossa and identify related structure Describe and identify major foramina With structures passing through it and its clinical relevance.	Practical, Lecture, small group discussion, DOAP session	3	General Surgery	
36	AN 57.4	Enumerate ascending and descending tracts at mid thoracic level of spinal cord	Lecture	6	Gen. Medicine	
37	AN 35.8	Describe anatomically relevant clinical features of thyroid swelling	Lecture,	3	General Surgery	
38	AN 29.3	Explain anatomical basis Of wry neck	Lecture,	1	General Surgery	
39	AN 30.5	Explain effects of pituitary tumour on visual pathway	Lecture,	2	Ophthalmology	
40	AN 54.1, 54.2	Describe and identify features of plain X ray abdomen Describe and identify the special radiographs of abdominopelvic region (Contrast X ray: Barium swallow, meal, enema, cholecystography, IVP and HSG)	Lecture, DOAP session	4	Radiodiagnosis	
41	AN 55.1, 55.2	Demonstrate the surface marking of regions and planes of abdomen, superficial inguinal ring, deep ring, McBurnry's point, renal angle and	Practical, Lecture, small group discussion,	2	Gen. surgery	-----

		Mur h's oint	DOAP session			
42	AN 52.7	Describe the development of urinary system	Lecture,	5	Gen Surgery	
43	AN 78.5, 80.4	Describe and demonstrate the superficial and deep perineal pouch Describe and identify perineal body	Lecture,	3	OBGY	
44	AN 54.3	Describe ERCP, CT abdomen, MRI, arteriography in radio diagnosis of abdomen	Lecture,	3	Radiodiagnosis	
45	AN 48.7	Mention the lobes involved in benign prostatic hypertrophy and prostatic cancer	Lecture,	1	General Surgery	
46	AN 47.5, 48.8	Describe and demonstrate Rectum and anal canal Mention the structures palpable during vaginal and rectal examination	Practical, Lecture, small group discussion, DOAP session	3	Gen Surgery and OBGY	Physiology
47	AN 15.3, 15.4	Describe and demonstrate boundaries, floor, roof and contents of femoral triangle Explain anatomical basis of psoas abscess and femoral hernia	Practical, Lecture, small group discussion, DOAP session	3	General Surgery	
48	AN52.8	Describe the development of male and female reproductive system	Lecture,	10	OBGY	
49	AN 16.3	Explain the anatomical basis of Trendelenburg sign	Lecture, DOAP session	2	General Surgery	
50	AN 17.2	Describe anatomical basis of complications of fracture neck of femur	Lecture,	3	Orthopedics	
51	AN 16.2	Describe anatomical basis of sciatic nerve injury during gluteal intramuscular injections	Lecture,	1	General Surgery	
52	AN 18.3	Explain anatomical basis of foot drop	Lecture	1	General Surgery	
53	AN 18.6	Describe knee injury with its applied anatomy	Lecture, DOAP session	3	General Surgery	
54	AN 70.2	Identify the lymphoid tissue under microscope and describing microanatomy of thymus and spleen	Lecture, Practical	1	Pathology	-----
55	AN 79.4	Describe the development of somites and intra embryonic coelom	lecture	1	OBGY	-----
56	AN 47.1—47.4	Describe and identify boundaries and recesses of lesser and greater sac. Name and identify various	Written/ Viva voce/ skill	1	Gen Surgery	

		peritoneal folds and pouches with its explanation. Explain anatomical basis of ascites and peritonitis Explain anatomical basis of subphrenic abscess	assessment			
57	AN 78.5, 80.4	Describe in brief abortion, decidual reaction and pregnancy test and PCPNDT Describe embryological basis of twinning in monozygotic and dizygotic twins	Lecture,	1	OBGY	
58	AN 47.5, 47.6	Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage & applied aspects). Explain the anatomical basis of, Liver biopsy (site of needle puncture), Referred pain in cholecystitis, Obstructive jaundice, Referred pain around umbilicus.	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	
59	AN 47.5, 47.6, 47.7	Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage & applied aspects). Explain the anatomical basis of Splenic notch, Accessory spleens, kehr's sign. Mention the clinical importance of Calot's triangle	Practical, Lecture, small group discussion, DOAP session	6	General Surgery	
60	AN 69.2	Describe the various types and structural and functional correlation of blood vessels	Lecture, Practical	2		Physiology
61	AN 47.5, 47.6	Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage & applied aspects)	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	-----

62	AN77.6, 79.5, 79.6	Describe teratogenic influences, fertility and sterility, surrogate motherhood and social significance of "sex ratio" Explain embryological basis of congenital malformation, sacrococcygeal teratomas and neural tube defects Describe the diagnosis of pregnancy in first trimester and role of teratogens, alpha fetorotein	Lecture,	1	OBGY	
63	AN 47.13	Describe the abnormal opening of thoracoabdominal diaphragm and diaphragmatic hernia	Lecture,	1	General Surgery	-----
64	AN 81.1 - 81.3	Describe various methods of prenatal diagnosis Describe indications, process and disadvantages of amniocentesis Describe indications, process and disadvantages of chorionic villus biopsy	Lecture,	1	OBGY	
65	AN 52.6	Describe the development and congenital anomalies of foregut, midgut and hindgut	Lecture,	4	General Surgery	-----
66	47.10, 47.11	Enumerate the sites of portosystemic anastomosis Explain the anatomic basis of hematemesis and caput medusa in portal hypertension	Lecture	1	General Surgery	
67	AN 47.5, 47.6	Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage & applied aspects). Explain anatomical basis of radiating pain of kidney to groin	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	
68	AN 49.4	Describe and demonstrate boundaries, contents and applied anatomy of ischiorectal fossa	Practical, Lecture, small group discussion, DOA? session	1	General Surgery	
69	AN 48.5, 48.6	Explain the anatomical basis of suprapubic cystostomy, urinary obstruction in benign enlargement of prostate. Describe anatomical basis of automatic bladder.	Lecture ,	2	General surgery	

70	AN25.7	Identify structure seen a plain x-ray chest (PA view)	Lecture	1	Radiodiagnosis, General Medicine	
71	AN25.8	Identify and describe in brief a barium swallow	Practical, DOAP session	1	Radiodiagnosis, General Medicine	
72	AN25.9	Demonstrate surface marking of lines of pleural reflection, lung borders and fissure, trachea, heart borders, apex beat & surface projection of valves of heart	Practical	1	General Medicine , Pediatrics	
73	AN44.1	Describe & demonstrate the planes (transpyloric, transtubercular, subcostal, lateral vertical, Linea semilunaris), regions & Quadrants of abdomen	Practical, Lecture, small group discussion, DOAP session	2	General Surgery	
74	AN44.4	Describe & demonstrate extent, boundaries, contents of inguinal canal including Hesselbach's triangle	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	
75	AN44.6 AN 44.7	Describe & demonstrate attachments of muscles of anterior abdominal wall Enumerate common Abdominal incisions	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	
76	AN46.1	Describe & demonstrate coverings, internal structure, side determination, blood supply, nerve supply, lymphatic drainage & descent of testis with its applied anatomy	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	
77	AN47.5	Describe & demonstrate major viscera of abdomen under following headings -STOMACH (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects)	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	
78	AN46.4	Explain the anatomical basis of Varicocele	Practical, Lecture,	1	General Surgery	-----

79	AN 46.5	Explain the anatomical basis of Phimosis & Circumcision	Lecture,	1	General Surgery	
80	AN 47.1 AN 47.2	Describe & identify boundaries and recesses of Lesser & Greater sac. Name & identify various peritoneal folds & pouches with its explanation	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	
81	AN 47.3 AN 47.4	Explain anatomical basis of Ascites & Peritonitis Explain anatomical basis of Subphrenic abscess	Lecture,	1	General Surgery	-----
82	AN 23.1	Describe & demonstrate the extent appearance, relations, blood supply, nerve supply, lymphatic drainage and applied anatomy of esophagus	Practical, Lecture DOAP session	1	General Surgery	-----
83	AN 23.2	Describe & demonstrate the extent relations tributaries of thoracic duct and enumerate its applied anatomy	Practical, Lecture DOAP session	1	General Surgery	-----
84	AN 23.7	Mention the extent, relations and applied anatomy of lymphatic duct	Practical, Lecture DOAP session	1	General Surgery	
85	AN 80.3A N 80.4	Describe formation of placenta, its physiological functions, fetomaternal circulation & placental barrier Describe embryological basis of twinning in monozygotic & dizygotic twins	Lecture ,	1	Obstetrics & Gynecology	
86	AN 80.7	Describe various types of umbilical cord attachments	Lecture ,	1	Obstetrics & Gynecology	
87	AN 78.3	Describe the process of implantation & common abnormal sites of implantation	Lecture ,	1	Obstetrics & Gynecology	
88	AN 70.2	Identify the lymphoid tissue under the microscope & describe microanatomy	Lecture, Practical ,	1	Pathology	-----

		of lymph node, tonsil and correlate the structure with function				
89	AN25.7	Identify structure seen a plain x-ray chest (PA view)	Lecture	1	Radiodiagnosis, General Medicine	
90	AN25.8	Identify and describe in brief a barium swallow	Practical, DOAP session	1	Radiodiagnosis, General Medicine	
91	AN25.9	Demonstrate surface marking of lines of pleural reflection, lung borders and fissure, trachea, heart borders, apex beat & surface projection of valves of heart	Practical	1	General Medicine, Pediatrics	
92	AN44.1	Describe & demonstrate the planes (transpyloric, transtuberular, subcostal, lateral vertical, Linea semilunaris), regions & Quadrants of abdomen	Practical, Lecture, small group discussion, DOAP session	2	General Surgery	
93	AN44.4	Describe & demonstrate extent, boundaries, contents of inguinal canal including Hesselbach's triangle	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	
94	AN47.5	Describe & demonstrate major viscera of abdomen under following headings — STOMACH(anatomic al position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects	Practical, Lecture, small group discussion, DOAP session	1	General Surgery	
95	AN 70.2	Identify the lymphoid tissue under the microscope & describe microanatomy of lymph node, tonsil and correlate the structure with function	Lecture, Practical,	1	Pathology	
96	AN74.1	Describe the various modes of inheritance with examples	Lecture	1	General Medicine, Pediatrics	
97	AN12.13	Describe the anatomical basis of Wrist drop	Lecture	1	General Surgery	
98	AN 66.2	Describe ultrastructure of connective tissue	Lecture	2	Pathology	
99	AN77.3	Describe spermatogenesis and oogenesis along with diagrams	Lecture Practical,	2	Obstetrics &	

					Gynecology	
100	AN24.1	Mention the blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura and describe the pleural recesses and their applied anatomy	Practical, Lecture	1	General Medicine	Physiology
101	AN 10.7	Identify side, external features and relations of structures which form root of lung & bronchial tree and their clinical correlate	Practical Lecture, small group discussion, DOAP session	1	General Medicine	Physiology
102	AN77.1	Describe the uterine changes occurring during the menstrual cycle	Lecture	1	Obstetrics & Gynecology	
103	AN 7.5	Describe principles Of sensory and motor innervation of muscles	Lecture,	1	General Medicine	Physiology
104	AN 7.6	Describe concept of loss of innervation of a muscle with its applied anatomy	Lecture,	1	General Medicine	
105	AN12.8	Describe anatomical basis of Claw hand	Lecture,	1	General Surgery	



**MGMIHS, Navi Mumbai
DEPT.OF PHYSIOLOGY**

Common List of Alignment and integration topics

Sr. No.	Competency No.	Competency	Teaching & Learning Method	Horizontal Integration	Vertical Integration
1	PY. 1.4	Apoptosis – Programmed cell death	Lecture + Small group discussion		Pathology
2	PY1.6	Fluid compartment of the body, its ionic composition & measurements	Lecture + Small group discussion	Biochemistry	
3	PY2.2	Discuss the origin, forms, variations and functions of plasma proteins	Lecture + Small group discussion	Biochemistry	
4	PY2.3	Describe and discuss the synthesis and functions of Hemoglobin and explain its breakdown. Describe variants of hemoglobin	Lecture + Small group discussion	Biochemistry	
5	PY2.5	Describe different types of anaemias & Jaundice	Lecture + Small group discussion	Biochemistry	Pathology
6	PY2.8	Describe the physiological basis of hemostasis and, anticoagulants. Describe bleeding & clotting disorders (Hemophilia, purpura)	Lecture + Small group discussion		Pathology
7	PY2.9	Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	Lecture + Small group discussion		Pathology

8	PY.2.12	Blood Indices	Lecture, Small Group discussion		General Medicine
9	PY 2.11	Blood Group Estimation	DOAP sessions		Pathology
10	PY 2.11	Total Leukocyte count	DOAP sessions		Pathology
11	PY 2.11	Estimation of bleeding time & clotting time	DOAP sessions		Pathology
12	PY2.12	Describe test for ESR	Demonstration		Pathology
13	PY 2.13	Platelet & Reticulocyte count	Demonstration sessions		Pathology
14	PY3.1	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines	Lecture, Small group discussion	Anatomy	
15	PY3.3	Describe the degeneration and regeneration in peripheral nerves	Lecture, Small group discussion		General Medicine
16	PY3.4	Describe the structure of neuro-muscular junction and transmission of impulses	Lecture, Small group discussion		Anaesthesia
17	PY3.7	Describe the different types of muscle fibers and their structure	Lecture, Small group discussion	Anatomy	
18	PY3.5/ PY3.6	Discuss the action of neuro-muscular blocking agents Describe the pathophysiology of Myasthenia gravis	Lecture, Small group discussion		Pharmacology Pathology
19	PY3.11	Explain energy source and muscle metabolism	Lecture, Small group discussion	Biochemistry	
20	PY3.12	Explain the gradation of muscular activity	Lecture, Small group discussion		General Medicine

21	PY3.13	Describe muscular dystrophy: myopathies	Lecture Small group discussion	Anatomy	General medicine
22	PY4.1	Describe the structure and functions of digestive system	Lecture Small group discussion	Anatomy	
23	PY4.2	Describe the composition, mechanism of secretion, functions, and regulation of saliva, gastric, pancreatic, intestinal juices and bile secretion	Lecture Small group discussion	Biochemistry	
24	PY4.4	Describe the physiology of digestion and absorption of nutrients	Lecture Small group discussion	Biochemistry	
25	PY4.7	Describe & discuss the structure and functions of liver and gall bladder	Lecture Small group discussion	Biochemistry	
26	PY4.8	Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests	Lecture Small group discussion	Biochemistry	
27	PY4.9	Discuss the physiology aspects of: peptic ulcer, gastro- oesophageal reflux disease, vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease	Lecture Small group discussion	Biochemistry	
28	PY5.1	Describe the functional anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system.	Lecture, Small group discussion	Anatomy	
29	PY5.5	Describe the physiology of E.C.G, its applications and	Lecture, Small group discussion		General medicine

		the cardiac axis			
30	PY5.6	Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction	Lecture, Small group discussion	Anatomy	
31	PY5.6	Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction	Lecture, Small group discussion		General medicine
32	PY 5.10	Regional circulation including microcirculation, lymphatic, coronary, cerebral, capillary, Skin, pulmonary and splanchnic circulation	Lecture, Small group discussion		General Medicine
33	PY5.12	Clinical examination of pulse	DOAP		General Medicine
34	PY5.13	Record and interpret normal ECG in a volunteer or simulated environment	DOAP		General Medicine
35	PY5.16	Recording Arterial pulse tracing using finger plethysmography in a volunteer or simulated environment	DOAP		General Medicine
36	PY 6.8	Technique to perform & interpret Spirometry	DOAP		Respiratory Medicine
37	PY7.7	Describe artificial kidney, dialysis and renal transplantation	Lecture		General Medicine
38		Describe & discuss		Biochemistry	

	PY 7.8	Renal Function Tests			
39	PY8.4	Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas	Lecture, Small group discussion	Biochemistry	
40	PY 9.1	Describe and discuss sex determination; sex differentiation and their abnormalities and outline psychiatry and practical implication of sex determination.	Lecture, Small group discussion	Anatomy	
41	PY9.6	Enumerate the contraceptive methods for male and female. Discuss their advantages & disadvantages	Lecture, small group discussion		Obstetrics & Gynaecology, Community Medicine
42	PY9.8	Describe and discuss the physiology of pregnancy, parturition & lactation and outline the psychology and psychiatry-disorders associated with it.	Lecture, small group discussion		Obstetrics & Gynaecology, Community Medicine
43	PY9.10	Discuss the physiological basis of various pregnancy tests	Lecture, small group discussion		Obstetrics & Gynaecology, Community Medicine
44	PY9.11	Discuss the hormonal changes and their effects during peri-menopause and menopause	Lecture, small group discussion		Obstetrics & Gynaecology, Community Medicine
45	PY9.12	Discuss the common causes of infertility in a couple and role of IVF in managing a case of infertility.	Lecture, small group discussion		Obstetrics & Gynaecology, Community Medicine
46	PY10.1	Describe and discuss the organization of nervous system		Anatomy	
47				Anatomy	

	PY10.2	Describe and discuss the functions and properties of synapse, reflex, receptors			
48	PY10.3	Describe and discuss somatic sensations & sensory tracts		Anatomy	
49	PY10.4	Describe and discuss motor tracts, mechanism of maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus		Anatomy	
50	PY10.5	Describe and discuss structure and functions of reticular activating system, autonomic nervous system (ANS)	Lecture, Small group discussion	Anatomy	
51	PY10.6	Describe and discuss Spinal cord, its functions, lesion & sensory disturbances.	Lecture, Small group discussion	Anatomy	
52	PY10.7	Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities.	Lecture, Small group discussion	Anatomy	
53	PY10.7	Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	Lecture, Small group discussion		Psychiatry
54	PY10.8	Describe and discuss behavioral and EEG characteristics during	Lecture, Small group discussion		Psychiatry

		sleep and mechanism responsible for its production			
55	PY10.11	Demonstrate the correct clinical examination of the nervous system: Higher functions, sensory system, motor system, reflexes, cranial nerves in a normal volunteer or simulated environment	DOAP	Anatomy	
56	PY10.12	Identify normal EEG forms	Lecture, Small group discussion		Psychiatry
57	PY10.13	Describe and discuss perception of smell and taste sensation	Lecture, Small group discussion		ENT
58	PY10.14	Describe and discuss patho-physiology of altered smell and taste sensation	Lecture, Small group discussion		ENT
59	PY10.15	Describe and discuss functional anatomy of ear and auditory pathways & physiology of hearing	Lecture, Small group discussion		ENT
60	PY10.16	Describe and discuss pathophysiology of deafness. Describe hearing tests	Lecture, Small group discussion		ENT
61	PY10.17	Describe and discuss functional anatomy of eye, physiology of image formation, physiology of vision including colorvision, refractive errors, color blindness, physiology of pupil and light reflex	Lecture, Small group discussion		Ophthalmology
62	PY10.18	Describe and discuss the physiological basis of lesion in visual pathway	Lecture, Small group discussion		Ophthalmology

63	PY10.19	Describe and discuss auditory & visual evoke potentials	Lecture, Small group discussion		ENT , Ophthalmology
64	PY.11.6	Physiology of Infancy	Lecture, Small group discussion		Pediatrics
65	PY.11.9	Interpret growth chart	Lecture, Small group discussion		Pediatrics
66	PY.11.10	Interpret anthropometric assessment of infants	Lecture, Small group discussion		Pediatrics



**MGMIHS, Navi Mumbai
DEPT.OF BIOCHEMISTRY**

Common List of Alignment and integration topics

Sr. No.	Competency No.	Competency	Teaching & Learning Method	No. of Hrs. requirement	Vertical Integration with following subject	Horizontal Integration with following subject
01	BI 6.1	Metabolism in Fed and Fasting Stage	Lecture	01	General Medicine	-----
02	BI 6.3	Metabolism of Nucleic acid	Lecture	01	-----	Physiology
03	BI 6.4	Metabolism of Nucleic acid	Lecture	01	General Medicine	-----
04	BI 6.9	Mineral metabolism- Calcium, Phosphorus, Sodium , Potassium	Lecture	01	General Medicine	Physiology
05	BI 6.10	Mineral metabolism- Calcium, Phosphorus, Sodium , Potassium, copper, zinc, selenium	Lecture	01	General Medicine	-----
06	BI 7.7	Role of free radicals in diseases	Lecture	01	General Medicine, Pathology	-----
07	BI 8.1	Nutrition	Lecture	01	Pathology, General Medicine, Pediatrics	-----
08	BI 8.4	Nutrition	Lecture	01	Pathology, General Medicine	-----
09	BI 8.5	Nutrition	Lecture	01	Community Medicine, General Medicine, Pediatrics	-----

10	BI 6.9	Estimation of Serum Phosphorus	SGT	04	General Medicine	Physiology
11	BI 11.17	Estimation of Serum Uric acid	SGT	04	General Medicine, Pathology	-----
12	BI 11.23	Calculate Energy content of food Items & glycemic Index	SGT	02	General Medicine	-----
13	BI 11.24	Calculate Energy content of food Items & glycemic Index	SGT	02	General Medicine	-----
14	BI 5.4	Tryptophan, Glycine, Sulphur containing amino acids Metabolism disorders Urea cycle disorders	Lecture	04	Pediatrics	-----
15	BI 6.7	ECE: Dehydration Water, electrolyte balance and imbalance	Lecture	01	General Medicine	Physiology
16	BI 6.13	ECE: Kidney diseases KFT	Lecture	01	Pathology, General Medicine	Physiology, Human Anatomy
17	BI 6.14	ECE: Kidney diseases, Jaundice KFT, LFT	Lecture	02	Pathology, General Medicine	Physiology, Human Anatomy
18	BI 3.9	Ketone Body Metabolism	Lecture	01	General Medicine	-----
19	BI 4.1	Phospholipid and Eicosanoids	Lecture	01	General Medicine	-----
20	BI 4.2	Fatty acid Synthesis, Fatty acid oxidation, Lipid storage disorders	Lecture	02	General Medicine	-----

21	BI 4.3	Lipoprotein metabolism, Cholesterol Metabolism, Fatty Liver Atherosclerosis	Lecture	03	General Medicine	-----
22	BI 4.6	Phospholipid and Eicosanoids	Lecture	01	General Medicine	-----
23	BI 11.17	Ketone Body Metabolism, Cardiac Biomarkers	Lecture	02	Pathology, General Medicine	-----
24	BI 5.3	Digestion and absorption of proteins, Transamination, Deamination, Fate of ammonia.	Lecture	02	Pediatrics	-----
25	BI 5.4	Phenylalanine and tyrosine metabolism and disorders	Lecture	01	Pediatrics	-----
26	BI 6.5	Vitamin A	Lecture	01	General Medicine	-----
27	BI 7.3	Genetic code, Gene Mutation, Translation	Lecture	01	Pediatrics	-----
28	BI 7.4	RDT, PCR	Lecture	02	General Medicine, Pediatrics	-----
29	BI 8.4	Obesity	Lecture	01	General Medicine, Pathology	-----
30	BI 9.2	Extra cellular matrix	Lecture	01	General Medicine	-----
31	BI 10.1	Biochemical basis of cancer	Lecture	01	Obstetrics & Gynaecology, General Surgery, Pathology	-----

32	BI 10.2	Tumour markers	Lecture	01	Obstetrics &Gynaecology, General Surgery, Pathology	-----
33	BI 10.3	Cell mediated immunity, Humoral immunity	Lecture	01	Obstetrics &Gynaecology, General Surgery, Pathology	-----
34	BI 10.4	Cell mediated immunity, Humoral immunity	Lecture	01	General Medicine, Pathology	Physiology
35	BI 10.5	Antigen, Vaccine development	Lecture	01	Pathology, Pediatrics, Microbiology	-----
36	BI 6.5	Vitamin D	Lecture	01	General Medicine	-----
37	BI 6.9	Minerals: Calcium, Phosphorus, Iodine, Copper	Lecture	01	General Medicine	Physiology
38	BI 6.10	Minerals: Calcium, Phosphorus, Iodine, Copper	Lecture	01	General Medicine	-----
39	BI 6.13	TFT	Lecture	01	Pathology, General Medicine	Physiology, Human Anatomy
40	BI 6.14	TFT, Adrenal FT	Lecture	01	Pathology, General Medicine	Physiology, Human Anatomy
41	BI 6.15	TFT, Adrenal FT	Lecture	01	Pathology, General Medicine	Physiology, Human Anatomy
42	BI 7.3	Regulation of gene expression	Lecture	01	Pediatrics	-----

43	BI 11.22	Calculate AG ratio and creatinine clearance	SGT	04	General Medicine	-----
44	BI 3.4	Glycolysis and PDH complex, Glycogen metabolism, Gluconeogenesis, Fructose and Galactose metabolism, Uronic acid pathway, HMP shunt, G6PD deficiency case	Lecture	05	General Medicine	-----
45	BI 3.7	Glycolysis and PDH complex, Glycogen metabolism, Gluconeogenesis, Fructose and Galactose metabolism, Uronic acid pathway, HMP shunt, G6PD deficiency case	Lecture	05	-----	Physiology
46	BI 3.8	Glycolysis and PDH complex, Glycogen metabolism, Gluconeogenesis, Fructose and Galactose metabolism, Uronic acid pathway, HMP shunt, G6PD deficiency case	Lecture	05	Pathology, General Medicine	-----

47	BI 3.9	Blood glucose regulation, Diabetes mellitus	Lecture	01	General Medicine	-----
48	BI 11.17	Blood glucose regulation, Diabetes mellitus Dyslipidemia Myocardial Infarction	Lecture/SGD	05	Pathology, General Medicine	-----
49	BI 4.2	Malabsorption syndrome, Digestion and absorption of lipids	Lecture	01	General Medicine	-----
50	BI 3.10	GTT chart	SGD/ LCD	02	General Medicine	-----
51	BI 6.5	Vit. K, Vit E, Vit C, Thiamine, Riboflavin, Niacin, Pantothenic acid, Pyridoxine, Biotin	Lecture	04	General Medicine	-----
52	BI 2.4	Enzyme Inhibition	Lecture	01	Pathology, General Medicine	-----
53	BI 2.5, BI 11.17	Enzyme pattern in pathological conditions	Lecture	01	Pathology, General Medicine	-----
54	BI 2.6	Enzyme based Assays	Lecture	01	Pathology, General Medicine	-----
55	BI 10.3	Immunoglobulin Biochemistry chart	SGT	02	Obgy&GyneGen.Surg eny Pathology	-----

56	BI 10.3	Immunoglobulins and Electrophoresis	Lecture	01	OBGY and GYNE Gen.Surgery Pathology	----
57	BI 10.4	Immune response	Lecture	01	Gen.Medicine Pathology	Physiology
58	BI 10.5	Vaccines	Lecture		Pathology Pediatrics Microbiology	----
59	BI 6.5	Vit K, Thiamin, Riboflavin ,Niacin	Lecture	01	General Medicine	----
60	BI 5.2 ,6.12.	Abnormal and Normal Hemoglobin	Lecture	02	Pathology, GeneralMedicine	Physiology
61	BI 6.5	Vit. B12, folic acid	Lecture	01	General Medicine	-----
62	BI 6.9, BI 6.10	Iron Metabolism Iron Metabolism	Lecture Lecture	 01	General Medicine General Medicine	Physiology -----
63	BI 6.11	HB Metabolism	Lecture	01	Pathology, General Medicine	Physiology
64	BI 4.1	Lipid Classification	Lecture	02	General Medicine	-----
65	BI 11.4	Normal and abnormal Urine constituents	DOAP	08	General Medicine	Physiology



MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

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