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NOTIFICATION

The Syndicate has, in exercise of its powers under section 27 (1) of UHS Ordinance 2002, approved the Revised Syllabi, Table of Specifications and OSPE format for First Professional MBBS Part-I and Part-II Examinations, in the subjects of Anatomy including Histology, Physiology and Biochemistry, to be implemented with effect from the academic session 2013-2014 and onwards.

REGISTRAR

No. UHS/REG-13/3446

Dated: 13-12-2013

Copy forwarded for information to:

- i. Principals/Heads of the Affiliated Medical Colleges for information of the Faculty and students
- ii. Controller of Examinations
- iii. Director (I.T.)
- iv. PSO to Vice Chancellor
- v. PS to Registrar

Encl. As above



REGISTRAR

SYLLABUS, ToS & OSPE

M.B.B.S.

FIRST PROFESSIONAL

PART-I

ANATOMY INCLUDING
HISTOLOGY

“GROSS ANATOMY”

The study of gross anatomy must lay emphasis on applied anatomy as related to clinical medicine and surgery. For teaching, actual dissection of cadaver, dissected specimens, models, and computer aided programs shall be used. Normal images of different diagnosis techniques i.e. X-rays and CT scans, MRI and Ultra-sonography shall also be introduced.

The time for dissection of the cadaver for each region is as under:

Upper Limb	-	12 weeks
Lower Limb	-	12 weeks
Thorax	-	8 weeks

“GENERAL ANATOMY”

After the end of the course, the students are able to:

1. Explain anatomical terms and sectional planes of the body.

2. Skeletal System:

1. Classify the skeleton system (appendicular and axial).
2. Classify bones on the basis of shape, size, evolution, structure, development, region and miscellaneous
3. Describe general features of bones of human body
4. Explain the functions of bones
5. Discuss the general concepts of ossification and growth of bones.
6. Describe the blood supply of bones
7. Comprehend clinical correlates of skeletal system (fractures, rickets, osteoporosis, osteomalacia, sternal puncture, avascular necrosis, radiological appearance of bone, cartilage and fractures)

3. Joints:

1. Explain the basis of classification of joints.
2. Discuss the characteristics, types and movement of synovial, cartilaginous and fibrous joints.
3. Mention and describe the factors responsible for the stability of joints.
4. Explain general principles of blood and nerve supply of joints.
5. Understand, describe, and analyze different clinical scenario resulting into dislocation of joints.

4. Muscles:

1. Describe different terms related to muscles.
2. Comprehend the basis of classification of muscles.
3. Describe general principles of blood and nerve supply of muscles.
4. Explain sprain, spasm, trophic degeneration and regeneration changes
5. Define and explain the mechanism of sprain and spasm.

6. Comprehend and explain the function of synovial structures related to muscles (tendon sheaths, bursae)
7. Understand and describe different form of fibrous structures occurring in skeletal muscles (aponeurosis, tendon, raphae)

5. Circulatory Systems:

1. Give the classification of circulatory systems (cardiovascular, lymphatic)

a) Cardiovascular System:

1. Understand and describe different types of cardiovascular circulation (Systemic, Pulmonary and Portal)
2. Understand and explain the classification and structures of different types of blood vessels.
3. Define, understand and classify anastomoses with examples and their clinical correlates

b) Lymphatic System:

1. Define and describe components of lymphatic system (lymph nodes and lymph vessels)
2. Comprehend the mechanism of production and circulation of lymph.
3. Describe the functions of lymphatic system and its role in spread of infection and cancer

6. Nervous System:

1. Name different components of nervous tissue (neuron, ganglion, nuclei, nerve, tracts)
2. Define and classify different types of nervous system (Somatic and Autonomic)
3. Enumerate different parts of somatic nervous system, their morphology and functions (central nervous system and peripheral nervous system).
4. Describe the formation and distribution of a typical spinal nerve.
5. Discuss the nerve plexus formation; define dermatomes and give their clinical importance.
6. Enumerate and describe different parts of autonomic nervous system and their functions (sympathetic nervous system and parasympathetic nervous system).
7. Define and comprehend reflex, reflex arc and referred pain.

7. Skin and Fascia:

1. Name different types of skin and mention its components (dermis and epidermis).
2. Enumerate its appendages and give their function (hair, nail, arrector pili muscles, sebaceous and sweat glands).
3. Comprehend and describe the structure and function of superficial and deep fasciae including retinaculae and septae.
4. Describe the skin lines and their significance.
5. Give clinical significance of discolouration of skin (jaundice, cyanosis and anemia).

8. Common Diagnostic Techniques used in the study of Human Body

1. Interpret normal radiographs of different regions of the body.
2. Identify displacement of the fracture segments of the bone.
3. Diagnose dislocation of the joints.
4. Understand and interpret ultra-sonographs of abdominal viscera.
5. Understand principle of CT scan and interpret the normal scans.
6. Comprehend MRI and interpret normal images of different diagnosis techniques i.e. X-rays and CT scans, MRI and Ultra-sonography.
7. Take the Biopsy and prepare it for examination.

“Course objectives of Upper & Lower Extremities / Limbs”

After the end of the course, the students are able to:

1. Develop an expertise in prosection and identification of structures in a cadaver
2. Develop clear concepts of the topographic anatomy of the regions.
3. Understand muscle attachments, their actions, nerve supply and effect of paralysis occurring in groups and important individual muscles
4. Develop clear concept of structure and mechanism of joints and the clinical conditions involving them.
5. Understand bones of the appendicular skeleton, their general and special features
6. Recognize and describe the bones of the foot and hand individually, in articulation and in skiagrams.
7. Develop clear concept about common fractures of the bones, displacement of their fragments and, factors causing it.
8. Understand nerve plexuses of limbs, their normal variations and different clinical conditions related to them.
- 9. Understand different kinds of injuries to the important nerves of the extremities, the ways these injuries are produced, their effects and clinical tests to diagnose the conditions.**
10. Recognize important superficial veins and their clinical uses.
11. Understand the mechanism by which the blood is pumped from lower limb and anatomical factors which predispose to development of varicose veins.
- 12. Understand anatomical relevance to important clinical conditions in the regions.**
13. Understand the scheme of regional lymphatic drainage and vascular supply.
14. Interpret normal skiagrams, C.T. Scans, MRI and Ultrasound.

“Course objectives of Thorax”

On completion of the Gross Anatomy of Thorax the students are able to:

1. Develop an understanding of the topographic anatomy of the region and describe it.
2. Understand and describe the anatomy of the bony thorax and costo-vertebral and other joints of thorax and the mechanism of respiration.
3. Understand and mark the important thoracic viscera and pleural reflections on the surface of the body.
4. Understand the importance of percussion notes in eliciting the extent of resonant and non resonant viscera and their clinical importance.

5. Give a precise account of the Anatomy of thoracic viscera, muscles, nerves, blood vessels and fasciae of the region and correlate anatomical information to common clinical conditions.
6. Understand and describe the scheme of the regional lymphatic drainage and lymph nodes.
7. Interpret normal skiagram, CT scan, MRI and other diagnostic techniques.

“GENERAL HISTOLOGY”

After the end of the course, the students are able to:

1. Enumerate and describe structure of different components of cell.
2. Classify the basic tissues of the body.
3. Classify and describe different types of epithelia with examples.
4. Comprehend and describe surface modification of plasmalemma (intercellular junctions, microvilli, cilia, stereocilia, basal striations).
5. Define, classify and describe different types of connective tissue proper with examples.
6. Comprehend and describe the structures of connective tissue cells, fibers and ground substance.
7. Classify and describe different types of cartilages with examples.
8. Classify bones from histological point of view (spongy and compact), and describe their microscopic structure.
9. Comprehend and describe histogenesis of bone (intramembranous and intracartilagenous).
10. Classify and describe light and electron microscopic structure of muscles (smooth, cardiac and skeletal).
11. Classify and describe the structure of neuron, neuroglial cells and nerve fibre
12. Describe microscopic structure of lymphoid organs (lymph node, spleen, tonsils and thymus) and give their functions.
13. Classify and describe different sub-division of vascular system.
14. Understand and describe microscopic structure of different types of blood vessels.
15. Describe microscopic structure of skin and its appendages (hair follicle, sebaceous and sweat glands) and give their functions.
16. Understand and describe the microscopic structure of mammary gland in different functional stages.
17. Describe the microscopic structure of respiratory system (nasal cavity, epiglottis, trachea, bronchi and lungs) and give the changes in structure correlating these to their functions.
18. Define apoptosis, hypertrophy, atrophy, metaplasia, hyperplasia, anaplasia, neoplasia, necrosis.
19. Identify, draw and label light microscopic structures of above mentioned tissues.

“EMBRYOLOGY”

After the end of the course, the students are able to:

1. Comprehend and describe the process of cell division (mitosis and meiosis) and gametogenesis.
2. Understand and describe ovarian and menstrual cycle.
3. Understand and describe fertilization, cleavage, blastocyst formation and implantation of the embryo (1st week of development).
4. Comprehend and describe stages of early embryonic development in second and third week of intrauterine life.
5. Understand and describe development of embryo (4th - 8th week of development).
6. Comprehend and describe fetal period (9th week to birth).
7. Define and describe fetal structures (amnion, chorion, yolk sac, allantois and umbilical cord)
8. Comprehend and describe formation of placenta, its structure and anomalies.
9. Understand and describe the basis of multiple pregnancies.
10. Understand and describe procedures for assessment of fetal status.
11. Define and understand clinical correlates i.e. anovulatory cycles, semen analysis and abnormal sites of implantation.
12. Understand In-Vitro Fertilization (IVF), assisted in-vivo fertilization.
13. Understand and describe the rationale of choriocarcinoma, pregnancy test, sacro-coccygeal teratoma, hydatidiform mole.
14. Understand the check points of estimation of gestational age and viability of fetus.
15. Understand the basis of intrauterine growth retardation, hydramnios, twin transfusion syndrome, conjoined twins, umbilical cord length variation, and amniotic bands.
16. Define teratogenesis and name common teratogens.
17. Describe the development of Integumentary system including mammary gland and their anomalies.
18. Describe the development of limbs and vertebral column including their anomalies.
19. Understand and describe the development of muscular system and their anomalies.
20. Understand and describe the structural and numerical chromosomal anomalies i.e. Klinefelter syndrome, Turner's syndrome, Super-female, Down's syndrome, Polyploidy.

Clinical Module

1. Describe clinical effects of nerve injuries of the upper and lower limbs
2. Explain the anatomical aspects of fracture of bones of upper and lower limbs (clavicle, humerus, radius, ulna, femur, tibia, fibula, scaphoid) and ribs
3. Explain the anatomical aspects of dislocation of joints of limbs
4. Describe anatomical basis of contracture, ganglia, pulp infection, carpal tunnel syndrome
5. Explain the anatomical basis of femoral hernia, varicose veins, bursitis and lymphadenitis
6. Describe anatomical basis of spread of carcinoma breast
7. Explain clinical importance of coronary circulation with reference to angina and myocardial infarction
8. Define cardiac tamponade, pericarditis and paracentesis in relation to anatomical aspects
9. Define pleural effusion, pleurisy, pleural tap, pneumothorax, hydrothorax, haemothorax, pneumonia, bronchogenic carcinoma, foreign body in airways in relation to anatomical aspects

RECOMMENDED BOOKS (Latest Edition):

1. General Anatomy by Prof. Tassaduq Hussain Sheikh
2. Medical Histology by Prof. Laiq Hussain Siddiqui
3. Cunningham's Clinical Dissector
4. Di-Fiore Atlas of Histology
5. Clinically Oriented Embryology by Keith L Moore
6. Clinically Oriented Anatomy by Keith Moore.
7. Cunningham's Manual of Practical Anatomy by G.J. Romanes, 15th Ed., Vol-I, II.

REFERENCE BOOKS

1. **Clinical Anatomy** by Snell.
2. **Grant's** Dissector of Anatomy.
3. Wheater's Functional Histology
4. **Basic histology** by Junqueira and Carneiro
5. **Grant's** Atlas of Anatomy
6. **Langman's embryology**

MBBS 1st Professional Part (I) OSPE

Gross Anatomy, Radiological Anatomy & Embryology

Gross & Radiological Anatomy and Embryology.

1. Total No. of stations 12, each station will have 02 marks and 04 spots of identification.
2. Each station shall be given 1.5 min.
3. Total marks shall be 24.

Gross Anatomy of Upper Limb, Lower Limb, Thorax, Radiological Anatomy & Embryology

Time per station: 1.5 minutes (18 minutes)

Sr.No	Region/Area	Station No	No of Spots	Marks Each Stations
1	Upper Limb	01	04	02
	Upper Limb	02	04	02
	Upper Limb	03	04	02
2	Lower Limb	04	04	02
	Lower Limb	05	04	02
	Lower Limb	06	04	02
3	Thorax	07	04	02
	Thorax	08	04	02
4	Radiological Anatomy	09	04	02
5	Embryology	10	04	02
	Embryology	11	04	02
	Embryology	12	04	02
	<u>Total</u>	<u>12</u>	<u>48</u>	<u>24</u>

HISTOLOGY OSPE AND VIVA

1. There shall be 10 slides fixed on 10 microscopes.
2. They will move from one to the next slide in a predetermined direction.
3. For each station one minute shall be given, students will give point/points of identifications for each slide (**Annexure A**).
4. Total number of identifications spots 10
 - a. Each spot will be given 01 mark (0.5 marks for identification and 2 points of identification, 0.25 marks each)
 - b. Total marks allocated shall be: 10
5. Time consumed shall be 10 min.

Long slide (Total Marks 10):

6. Time: 15 minutes will be given for
- | | |
|----------------|--------|
| Identification | 1 mark |
| Drawing | 1 mark |
| Labeling | 1 mark |

Interactive Examination Long Slide: 7 marks

ANATOMY STRUCTURED VIVA

The following areas shall be examined; the questions are framed with emphasis on those areas which are not easily evaluated in theory examinations. Course segments, the marks allocation and number of questions for each are given as under:

Sr. #	Course Area	Marks allocated	Minimum Number of Questions
1.	Surface marking	04	01
2.	Upper limb	10	02
3.	Lower limb	10	02
4.	Thorax	10	02
5.	Embryology	12	03
<u>Total</u>		<u>46</u>	<u>10</u>

Note: Materials for the examination shall be the responsibility of the Department/ College which should be put in place well before the time of the examination. Examination space and facilities shall be evaluated by the external examiner who will make sure that the movements of the candidate are well organized to maintain the transparency of the procedure.

Standardized Identification Points for Histology Slides for 1st Year MBBS Class

General Histology

SIMPLE EPITHELIUM

Simple squamous epithelium:

Slide view →

- a) Single layer of flattened / elongated/ fusiform cells
- b) Central elongated bulging nucleus

Surface view →

- a) Single layer of flattened / squamous cells
- b) Central round nucleus

Simple cuboidal epithelium:

- a) Single layer of cuboidal / square shaped cells
- b) Central round / spherical nucleus

Simple columnar epithelium:

- a) Single layer of tall / cylindrical cells
- b) Elongated nucleus in basal part of each cell/ oval basal nucleus

Simple columnar ciliated epithelium:

- a) Single layer of tall / cylindrical cells
- b) Hair like cilia (on luminal surface)

Pseudostratified columnar epithelium:

- a) Single layer of short basal and tall columnar cells
- b) Nuclei at different levels

Pseudostratified columnar ciliated epithelium:

- a) Single layer of tall columnar ciliated cells and short round / cuboidal basal cells
- b) Nuclei at different levels

STRATIFIED EPITHELIUM

Stratified squamous non keratinized epithelium:

- a) Multilayered epithelium
- b) Superficial layer consisting of non-keratinized squamous cells

Stratified squamous keratinized epithelium:

- a) Multilayerd epithelium
- b) Superficial layer of keratinized squamous cell

Stratified cuboidal:

- a) Multilayered epithelium
- b) Superficial / surface cuboidal cells

Stratified columnar epithelium:

- a) Multilayered epithelium
- b) Surface columnar cells

Transitional epithelium:

- a) Multilayered epithelium
- b) Surface layer consists of dome-shaped cells] Any one of b, c, d
- c) Middle layer consists of pear shaped cells / polyhedral cells]
- d) Basal layer consists of cuboidal / columnar cells]

CONNECTIVE TISSUE

Areolar tissue / Loose connective tissue:

- a) Abundant ground substance with Connective tissue cells
- b) Scattered / dispersed fibres (collagen fiber bundles / elastic fibers)

Adipose tissue (H & E):

- a) Vacuolated round or oval cells
- b) Peripheral nucleus

Dense regular fibrous connective tissue:

- a) Regularly-arranged densely packed collagen fibre bundles
- b) fibroblasts in between the fibre bundles

Dense regular elastic connective tissue:

- a) Densely packed elastic fibres
- b) Fibroblasts in between the fibres

Dense irregular connective tissue:

- a) Densely packed scattered various types of connective tissue fibres
- b) Fibroblasts nuclei in between the fibres / scanty ground substance

Mucoid connective tissue:

- a) Abundant ground substance
- b) Stellate fibroblasts / mesenchymal cells

Hyaline costal cartilage:

- a) Homogeneous matrix with isogenous group of chondrocytes
- b) Perichondrium

Hyaline articular cartilage:

- a) Isogenous groups of chondrocytes in homogenous matrix
- b) Perichondrium absent] Any one of b, c
- c) Isogenous groups of chondrocytes in vertical columns]

Elastic cartilage:

- a) Elastic fibres in the matrix
- b) Perichondrium] Any one of b, c
- c) Isogenous groups of chondrocytes]

Fibrocartilage:

- a) Collagen fibres in the matrix
- b) Chondrocytes in between fibres] Any one of b, c
- c) Perichondrium absent]

Compact bone:

- a) Haversian systems
- b) Outer and inner circumferential, interstitial lamellae

Spongy bone:

- a) Bony trabeculae with osteocytes
- b) Irregular marrow cavities

MUSCLES:

L.S. Skeletal muscles:

- a) Elongated / cylindrical muscles fibres with cross striations
- b) Multiple subsarcolemmal / peripheral nuclei

T.S. Skeletal muscles:

- a) Bundles of transversely cut muscle fibres
- b) Peripheral rounded nuclei

Cardiac muscles:

- a) Elongated / cylindrical branching striated muscle fibres
- b) Central single nucleus] Any one of b, c
- c) Intercalated discs]

Smooth muscles:

- a) Spindle shaped non striated muscle cells
- b) Single oval central nucleus

NERVOUS TISSUE

TS peripheral Nerve:

- a) Bundles of transversely cut nerve fibres (axons)
- b) Epineurium / perineurium / endoneurium

Sensory ganglion:

- a) Rounded pseudounipolar neurons in groups at the periphery
- b) Bundles of nerve fibres in central region] Any one of b, c
- c) Thick connective tissue capsule]

Autonomic ganglion:

- a) Small multipolar neurons
- b) Cells bodies of neurons scattered irregularly

Spinal cord:

- a) Central canal
- b) Inner H-shaped gray matter] Any one of b, c
- c) Out white matter]

Cerebrum:

- a) Outer gray matter and inner white matter
- b) Pyramidal cells in gray matter

Cerebellum:

- a) Outer gray matter and inner white matter
- b) Purkinje cell layer

Elastic artery:

- a) Predominant elastic fibres in tunica media
- b) Internal elastic lamina not identifiable in tunica media

Muscular artery:

- a) Predominant smooth muscle fibres in tunica media
- b) Prominent internal elastic lamina

Vein:

- a) Thin tunica media
- b) Thick tunica adventitia containing abundant collagen fibres

RESPIRATORY SYSTEM**Epiglottis:**

- a) Elastic cartilage
- b) Stratified squamous non keratinized epithelium / pseudostratified columnar epithelium

Trachea:

- a) Pseudostratified columnar ciliated epithelium
- b) C-shaped hyaline cartilage

Lung:

- a) Alveoli lined by simple squamous epithelium
- b) Sections of bronchi and bronchioles

LYMPHOID ORGANS:**Lymph node:**

- a) Cortex containing lymph nodules
- b) Cords of lymphoid tissue in medulla

Palatine tonsil:

- a) Non-keratinized stratified squamous epithelium
- b) Tonsillar crypts] Any one of b, c
- c) Lymph nodules]

Thymus:

- a) Thymic (Hassall's) corpuscles in medulla
- b) Cortical lobules containing densely packed lymphocytes (thymocytes)

Spleen:

- a) Red pulp with splenic cords and venous sinuses
- b) White pulp containing lymphatic nodules

INTEGUMENTARY SYSTEM**Thin skin:**

- a) Epidermis with thin layer of keratinized cells
- b) Dermis containing hair follicles

Thick skin:

- a) Epidermis with thick stratum corneum and prominent stratum lucidum
- b) No hair follicles