

## Scheme for first Professional MBBS University Examination in Anatomy

### A. Written Paper:

**Paper I** - Superior Extremity, Inferior Extremity, Abdomen & Pelvis with relevant Embryology & histology, and, General Embryology.

**Paper II** – Thorax, Head & Neck, Central Nervous System, Bulbous Oculi, With relevant Embryology & histology, Genetics, and, General Anatomy.

*The four questions in each theory paper will preferably have the following distribution of marks.*

Q. 1) One long essay type question (out of two) consisting of 2-4 small segments. Marks for each segment will be indicated separately. Marks may be 12.

Q. 2) Two short essay type question (out of three), each consisting of 2-3 small segments and marks for each segment will be indicated separately. Marks may be 14 (7 x 2).

Q. 3) Four short notes (out of five).

Marks may be 12 (3 x 4)

Q. 4) Four short clinically oriented explanatory notes (out of four).

Marks may 12 (3 x 4)

**Answer to each question should be given by the candidates in a separate answer book**

**Only one examiner will examine all the answer scripts to the same question of the paper in that center. Preferably each external examiner will examine answer script of Q2 of one paper & Q4 of the other paper. Each examiner will examine answers to one question of each paper.**

### B. Oral/Viva

i) For questions on Osteology with general anatomy - 8+2 marks

(2 bones from appendicular skeleton & 2 bones from axial skeleton)

i) For questions on Viscera with Embryology -8+2 marks

(4 specimens- one each from upper abdomen, Pelvis/thorax, Head & neck, Brain/ Eyeball).

### C. Practical:

○ **Window Dissection** – 10 marks

○ **Identification** – 12 marks

(5 structures, one each from each part of the body + one cross section from any part of the body are to be identifications are to be given as flag marks and they will be same for the whole batch of the same day. – 0.5 marks for each identification and three questions on each item valued @ 0.5 each.

○ **Surface marking** – 6 marks (line drawing: 4 marks + point: 2 marks)

○ **Radiology** - 3 marks

○ **Histology** - 9 marks (5 stained slides for identification: 1 mark each

+ 1 special side: 4 marks)

### D. Internal Assessment Marks:

Total marks-40

#### Distribution of Internal Assessment Marks

#### 1. Continuous Day-to-day Assessment

| Parts of the Body | ORAL | PRACTICAL |
|-------------------|------|-----------|
|-------------------|------|-----------|

|                  | Full Marks | Marks Obtained | Full Marks | Marks Obtained |
|------------------|------------|----------------|------------|----------------|
| Sup. Extremity   | 15         |                | 15         |                |
| Inf. Extremity   | 15         |                | 15         |                |
| Abdomen          | 25         |                | 25         |                |
| Thorax           | 10         |                | 10         |                |
| Head & Neck      | 20         |                | 20         |                |
| CNS & Eyeball    | 15         |                | 15         |                |
| Total            | 100        |                | 100        |                |
| 10% of the Marks | 10         | A              | 10         | B              |

**NB-** At time of completion of a part, the marks for different items should offered after considering overall performance & regularity in attendance

## 2. Periodical Institution Assessment Examination

|                                    | WRITTEN    |                | PRACTICAL  |                |
|------------------------------------|------------|----------------|------------|----------------|
|                                    | Full Marks | Marks Obtained | Full Marks | Marks Obtained |
| At End of 1 <sup>st</sup> Semester | 50         |                | 50         |                |
| At End of 2 <sup>nd</sup> Semester | 50         |                | 50         |                |
| Total                              | 100        |                | 100        |                |
| 10% of the marks                   | 10         | C              | 10         | D              |

### Question pattern in written examination of Periodical institutional Assessment-

The number of questions in each theory will be four (4) having the following distribution of marks.

Q. 1) One long essay type question (out of two) consisting of 2-4 small segments. Marks for each segment will be indicated separately. Marks may be 12.

Q. 2) Two short essay type questions (out of three) consisting of 2-3 small segments and marks for each segment will be indicated separately. Marks may be 14 (7 x 2).

Q. 3) Four short notes (out of five) Marks may be 12 (3 x 4).

Q. 4) Four short clinically oriented explanatory notes (out of four). Marks may 12 (3 x 4)

### Scheme for practical examination of Periodical institutional Assessment-

- 5(five) identifications and crossing - 15 marks
- Window dissection - 15 marks
- Surface marking - 6 marks
- Imaging - 4 marks
- Histology- 5 slides - 5 marks
- Laboratory Note book - 5 marks

## SYLLABUS for First professional M.B.B.S. in Anatomy

### I. Lecture classes:

Each lecture class shall be of one hour duration. Break up of only the important topics of the relevant parts are given below.

**A. Introduction: Total lecture classes - 2**

1. Significance of anatomy in medical science, subdivisions of the subject, Nomenclature & terminology: (1)
2. Skin & subcutaneous tissue: (1)

**B. General Anatomy: Total lecture classes- 22**

1. Introduction, cellular organelles, cell membrane: (4)
2. Connective tissue: (3)
3. Sclerous tissue with ossification: (3)
4. Joints: (2)
5. Muscle tissue with Ultrastructures: (2)
6. Nerve tissue including introduction to Autonomic nervous system: (5)
7. Blood vascular & lymphatic system: (3)

**C. General Embryology: Total lecture classes- 16**

1. Germ cells & their maturation: (2)
2. Changes in Reproductive organs at puberty & in pregnancy, Menstrual & Cycle, Contraception: (3)
3. Fertilisation, Implantation, Trophoblast, Yolk sac, Gastrulation, Extra-embryonic coelome, Notochord, Neuro-enteric canal, Intra-embryonic mesoderm: (3)
4. Decidua, chorion, yolk sac, connecting stalk: (1)
5. Placenta, umbilical cord, amniotic cavity & Foetal Circulation: (3)
6. Derivatives of, ectoderm, endoderm, mesoderm : (1)
7. Multiple & ectopic Gestation, Hydatidiform mole, placental abnormalities: (2)
8. Teratology: (1)

**D. Medical Genetics- Total lecture classes- 5**

DNA, RNA, Protein synthesis, Chromosomes, cell division, Karyotyping, Chromosomal abnormalities, Non-dysjunction, Anaphase lag, Mutation, Types of inheritance patterns, common genetic diseases.

**E. Superior Extremity: Total lecture classes- 17**

1. Limb buds and dermatomes: (1)
2. Venous Drainage and Axillary Lymph Nodes: (2)
3. Mammary Gland with applied anatomy: (2)
4. Brachial Plexus, its branches & Applied Anatomy: (4)
5. Shoulder joint with Girdle movement: (2)
6. Elbow, Radio-ulnar & Wrist joints: (3)
7. Small joints of hand, 1<sup>st</sup> Carpometacarpal joint: (2)
8. Fascial Spaces of Hand with Carpal Tunnel: (1)

**F. Inferior Extremity: Total Lecture Classes-11**

1. Venous & Lymphatic drainage with Applied importance: (2)
2. Femoral Triangle, Femoral sheath, with Hernia: (1)
3. Hip joint with applied anatomy: (2)
4. Knee Joint with applied anatomy: (2)
5. Ankle joint, Joints of foot & Mechanism of the foot: (4)

**G. Abdomen: Total lecture classes- 30**

1. Inguinal Canal, Inguinal Hernia, Umbilicus with Clinical anatomy: (2)
2. Peritoneum including recesses (with development): (2)
3. Structure of Liver & Biliary apparatus (Intra-& Extra-hepatic): (3)
4. Portal vein with porta-caval anastomosis: (1)
5. Pelvic Diaphragm, Perineum: (3)

6. Structure of spleen & splenic circulation: (1)
  7. Structure & blood supply of Kidney: (3)
  8. Nerve supply of bladder, mechanism of micturition: (1)
  9. Internal iliac artery & its branches: (1)
  10. Lymphatics of abdomen & pelvis: (1)
  11. Development of G.I Tract, rotation of gut and development of Liver & Pancreas with anomalies: (5)
  12. Development of Genito-urinary system: (7)
- H. Thorax: Total lecture classes- 17 (including Development)**
1. Mechanism of Thorax & Respiration: (2)
  2. Oesophagus, Thoracic duct: (1)
  3. Blood supply of heart: (2)
  4. Conducting system of heart: (1)
  5. Microanatomy of Lungs & Bronchial tree: (3)
  6. Development of Cardiovascular System & diaphragm: (8)
- I. Head & Neck: Total lecture classes- 30 (including Development)**
1. Deep Cervical fascia with its Applied importance (including Carotid Sheath): (2)
  2. 3<sup>rd</sup>, 4<sup>th</sup>, and 6<sup>th</sup> Cranial Nerves: (2)
  3. 5<sup>th</sup> Cranial Nerve: (3)
  4. 7<sup>th</sup> Cranial Nerve: (2)
  5. 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup>, Cranial Nerves: (2)
  6. Middle Ear Cavity: (2)
  7. Orbit (Extra-ocular muscles mainly): (2)
  8. Craniovertebral joints: (1)
  9. Intervertebral Joints: (1)
  10. Cervical lymph nodes: (1)
  11. Pituitary with its development: (2)
  12. Temporomandibular joint and Infratemporal fossa: (2)
  13. Dural venous sinus: (2)
  14. Branchial apparatus, development of face, palate mouth, nose, tongue: (6)
- J. C.N.S: Total lecture classes-20 (including Development)**
1. Introduction, Development of CNS with general Neural arrangement: (2)
  2. Spinal cord with Internal organization: (3)
  3. Cerebellum: (2)
  4. CSF, Sub-arachnoid Cisterns: (2)
  5. Organisation of Cerebral cortex: (1)
  6. White fibres of Brain: (2)
  7. Limbic system (with Olfactory pathways): (2)
  8. Blood supply of Brain: (3)
  9. Visual and Auditory pathways: (3)

**Thus, the total number of Lecture Classes may be approximately 170 hours and the breakup is as follows-**

| <b>First Semester-</b>    | <b>Total classes- 91</b> | <b>Second Semester-Total classes-79</b> |
|---------------------------|--------------------------|---|
| A. Introduction -2        |                          | G. Abdomen (Embryology) -12             |
| B. General Anatomy -22    |                          | H. Thorax -17                           |
| C. General embryology -16 |                          | I. Head & Neck -30                      |
| D. Genetics -5            |                          | J. C.N.S. -20                           |

- E. Superior Extremity -17  
 F. Inferior Extremity -11  
 G. Abdomen -18

## II. Practical / Dissection / Demonstration / Tutorial:

**Break up of only the important topics of the relevant parts are given below:-**

**Histology: Total 36 classes of 1½ hours duration = 54 hours (To be taught during 2<sup>nd</sup> Semester)**

**General- Total 12 classes**

1. Introduction, different types of Microscopes, specially compound light microscopes
2. Methods of tissue preparation and H & E staining procedures- General outlines
3. Epithelial tissue-types, and Glandular tissue
4. Cartilage-types
5. Bones-types, with Haversian system
6. Muscles- type

**Systemic Tissue: Total 24 classes (including 4 revision classes)**

|  |                                   |
|--|-----------------------------------|
| 1. General plan of GI tract & Oesophagus | 11. Kidney                        |
| 2. Stomach                               | 12. Ureter, Urinary Bladder       |
| 3. Small gut & Duodenum                  | 13. Lymph nodes & Palatine tonsil |
| 4. Large Gut & Vermiform Appendix        | 14. Spleen                        |
| 5. Liver                                 | 15. Skin                          |
| 6. Salivary glands, Tongue               | 16. Uterus & Fallopian tube       |
| 7. Pancreas & Thyroid                    | 17. Vas deferens & Prostate       |
| 8. Suprarenal glands                     | 18. Cerebellum & Spinal cord      |
| 9. Testis & Ovary                        | 19. Thymus & Mammary gland        |
| 10. Trachea & Lungs                      | 20. Placenta & umbilical cord     |
| <b>Revision Classes- 4</b>               |                                   |

## Dissection / Demonstration:

**A.Superior Extremity: Total Classes- 30 (To be taught during August-September)**

- . Bones of Upper limb-Scapula, Clavicle, Humerus, Radius and Ulna, Skeleton of Hand : 7
- . Clavipectoral Fascia & Mammary Gland : 2
- . Axilla : 3
- . Cubital fossa : 1
- . Front of arm : 1
- . Front of forearm with palm : 3
- . Back of Arm, Scapular region : 3
- . Back of forearm with Dorsum of Hand : 3
- . Shoulder Joint : 1
- . Elbow, radio-ulnar & wrist joints : 2
- . Small joints of hand : 1
- Radiology and surface markings : 2
- Part completion : 1

**B. Inferior Extremity: Total Classes – 28 (To be taught during September – October)**

- Bones of lower limb- Hip, Femur, Tibia, Fibula, Skeleton of foot  
Femoral triangle, Adductor region, Quadriceps : 4
- Anterolateral compartment of leg with dorsum of foot: 3
- Gluteal Region : 2
- Popliteal fossa : 2
- Back of thigh : 1
- Back of leg : 1
- Sole (prosected part) : 1
- Hip joint : 1
- Knee joint : 1
- Joints of foot and ankle joint : 1
- Surface marking and radiology : 2
- Part completion : 1

**Abdomen: Total Classes – 58 (To be taught during November – January)**

- Vertebrae & bony Pelvis- Cervical, Thoracic, Lumbar,  
Sacrum & Coccyx, Vertebral column with applied : 9
- Inguinal region, male external genitalia (scrotum, penis & Testes): 4
- Rectus sheath & anterolateral abdominal wall : 2
- Peritoneum with visceral disposition (Lesser sac, Lesser omentum,  
Epiploic foramen, Pouch of Morrison, Paracolic gutter) : 2
- Coeliac trunk with removal of stomach, Ventral branches of Abdominal Aorta :  
2
- Posterior Abdominal wall with Lumbar plexus : 2
- Dissection of Pelvic Walls with internal. Iliac arteries : 2

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 Total 23 Classes

- Stomach : 2
- Liver with biliary apparatus : 3
- Duodenum- Pancreas- Spleen : 2
- Small gut with the Mesentery : 2
- Large gut ( upto ilic colon) : 2
- Sigmoid colon, Rectum and anal canal : 2
- Kidney with ureter and suprarenal gland : 3
- Urinary bladder, Prostate, Male Urethra, Seminal Vesicle and Vas deferens  
: 4
- Perineum (prosected part) : 2
- Broad ligament, Fallopian tube and ovary : 3
- Uterus, Vagina, Female external genitalia, placenta : 3
- Sectional anatomy – at TPP level, at L3 level, Coronal  
& Sagittal section of male and female pelvis : 4
- Surface markings : 1
- Radiology : 1
- Part completion : 1

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 Total 35 classes

**D. Thorax : Total Classes – 23 (To be taught during February)**

- Ribs and Sternum : 3
- Anterior chest wall, Intercostal spaces & removal of lungs: 2
- Mediastinum (Subdivision and Contents, Root of lungs, Arch of aorta, Vagus and phrenic Nerves, Ligamentum arteriosum, Oesophagus, Thoracic Duct) : 2
- Pericaedium with Heart in situ (transverse and oblique sinuses): 5
- Posterior Thoracic Wall (Azygos venous system with Arch of Azygos vein, Splanchnic Nerves) : 2
- Lungs, Pleura, Trachea & Bronchial Tree : 4
- The Diaphragm : 1
- Cross sectional study at T3/T4 & T6/T7 level : 1
- Radiology and Surface markings : 2
- Part Completion : 1

**E. Central Nervous System & Eye Ball: Total Classes – 26 (To be taught during March – April)**

- Spinal Cord – Gross anatomy with blood supply : 3
- Brain stem – Gross anatomy with exit of Cranial nerves : 3
- Cerebellum with 4<sup>th</sup> Ventricle : 2
- Cerebrum – Gross anatomy with Sulci and gyri, Subarachnoid cisterns and blood supply : 3
- 3<sup>rd</sup> Ventricle, basal ganglia, Thalamus and diencephalons : 3
- Transverse section with Internal capsule : 2
- Sagittal section : 2
- Lateral ventricle : 2
- Fornix with rhinencephalon : 1
- Eye ball : 4
- Part completion : 1

**G. Head & Neck: Total Classes – 45 (To be taught during April – June)**

- Skull – Enumeration of individual skull bones with various Norma, Mandible, Hyoid : 11
- Scalp, Face, lacrimal apparatus, Parotid region : 4
- Dural venous sinuses, meninges : 2
- Posterior triangle : 2
- Anterior triangle : 3
- Suboccipital triangle (prosected part) : 1
- Submandibular region : 2
- Temporal and Infratemporal fossa : 2
- Temporomandibular joint : 1
- Cranial fossa and Orbit : 2
- Prevertebral region : 1
- Thyroid and parathyroid : 1
- Sagittal section of H & N, Nose and nasal septum, Tongue and Oral Cavity, Pharynx. Tonsil, Palate, Larynx : 8
- Kidney from back : 2
- Radiology and Surface markings : 2



- Part completion : 1

**Thus, total no of dissection/demonstration classes are:**

|                       |   |    |                                      |
|-----------------------|---|----|--------------------------------------|
| A. Superior Extremity | - | 30 | 1 <sup>st</sup> semester 116 classes |
| B. Inferior Extremity | - | 28 |                                      |
| C. Abdomen            | - | 58 |                                      |

**The osteology classes for the limb bones, vertebrae, sternum & ribs shall be taken from 11am to 12:30 pm during 1<sup>st</sup> semester.**

|                         |   |    |                                     |
|-------------------------|---|----|-------------------------------------|
| D. Thorax               | - | 23 | 2 <sup>nd</sup> semester 94 classes |
| E. Head & Neck          | - | 45 |                                     |
| F. C.N.S. with Eye ball | - | 26 |                                     |

**Total Dissection- 210 classes each of 2 hours duration (approximately 420 hours,)**

|                  |   |           |
|------------------|---|-----------|
| Dissection Hours | - | 420       |
| Histology Hours  | - | 54        |
| Lecture Hours    | - | 170       |
| Total            | - | 644 hours |

Revision Classes - 22 hours

**Areas for integrated teaching involved**

1. Birth control methods – anatomical basis
2. Genetic disorders
3. Congenital anomalies
4. Neuroanatomy

**Departments to be**

Gynae & Obstt., Surgery  
Different Clinical departments  
Paediatrics, Gynae & Obstt.  
Physiology, Neurology, Medicine

**MODEL QUESTIONS (1 st Prof MBBS)**

**ANATOMY  
First Paper**

Time : Three Hours

Full Marks : 50

*The figures in the margin indicate full marks.*



1. Write any one of the following :
- (a) A young woman is suffering from a mammary gland infection with severe pain. Describe the quadrants of breast. Using your knowledge in anatomy, explain the cause of mastitis, swelling and pain of breast. Discuss briefly the sets of axillary lymph nodes.  $2+4+6=12$
- (b) A young man was admitted in the hospital with indirect inguinal hernia. What are the different types (congenital) of indirect inguinal hernia? Describe the boundary and contents of the inguinal canal. Using your knowledge in anatomy, discuss the mechanism which normally prevent inguinal hernia.  $2+6+4=12$
2. Discuss briefly the following (any two) :  $7 \times 2 = 14$
- (a) Following fracture dislocation of the right shoulder joint, a young adult patient developed 'wrist drop'. Which nerve is likely to be damaged? Discuss the distribution of the nerve in different segments of the upper limb. Mention the area of skin of hand that would show sensory loss.  $1+5+1=7$
- (b) A middle aged woman was admitted with a small painful swelling in her right groin, which was diagnosed as 'femoral hernia. Describe the 'canal' in relation to the femoral hernia. How it could be distinguished anatomically from inguinal hernia and why it is more common in female? Describe the inferior Epigastric artery in the context of femoral hernia.  $3+2+2=7$
- (c) A young man was admitted with acute pain extending from the right loin to the right groin. Radiologically, a radio-opaque calculus (stone) was found in the right ureter. Using your knowledge in anatomy, discuss the causes and the area of distribution of pain. Where does one look for the course of ureter in the X-ray plate? Enumerate the position of the normal constrictions of the ureter, where a calculus is likely to be held up.  $3+2+2=7$
3. Write short notes on (any four) :  $3 \times 4 = 12$
- (a) Epiploic foramen. (b) Membranous urethra. (c) Notochord.  
(d) Special characteristics of the clavicle. (e) Development of pancreas
4. Write brief explanatory notes, using your knowledge in anatomy  $3 \times 4 = 12$
- (a) A new born baby presents leakage of urine through umbilicus.
- (b) A chronic alcoholic adult male, suffering from cirrhosis of liver, was admitted in the hospital with bouts of haematemesis (vomiting of altered blood)..
- (c) Avascular necrosis of head following intracapsular fracture of the neck of femur in old age.
- (d) In carpal tunnel syndrome, there is burning pain sensation along the lateral three and half fingers, but no sensory impairment over the thenar eminence.

**ANATOMY**  
**Second Paper**

Time : Three Hours

Full Marks : 50

*The figures in the margin indicate full marks.*

1. Write any one of the following :

(a) A young woman was admitted in the hospital with a large, solitary swelling in front of the neck, which moved upward during swallowing. It was diagnosed as a tumour of the thyroid gland for which she was operated. But she developed husky voice. Why does the thyroid gland move up with swallowing? Describe the different parts, relations and blood supply of the gland. Using your knowledge in anatomy, explain the development of husky voice after thyroidectomy.  
 $2+8+2=12$

(b) An old woman with a history of trauma to the right eye, was complaining of acute pain as well as loss of vision of that eye. After careful examination it was found that there was abnormal increase in intraocular pressure (glaucoma) due to obstruction to the aqueous humor drainage. What is aqueous humor and what are its functions? Discuss the formation, circulation and drainage of the aqueous humor along with its applied importance.  
 $5+7=12$

2. Discuss briefly the following (any *two*) :

(a) A young woman was admitted in the hospital in unconscious state. It was diagnosed as a case of 'cavernous sinus thrombosis', following a small abscess on the 'dangerous area of the face'. Discuss the communications of Face with cavernous sinus. What are the other communications of the cavernous sinus? What do you mean by the dangerous area of the face?  
 $2+3+2=7$

(b) Following a fracture involving the spine of sphenoid, a patient developed impairment of taste sensation of tongue. Which nerve is injured in this case? Discuss briefly about the nerve.  
 $1+6=7$

(c) A middle aged man was suffering from tuberculosis of lung, localized to one bronchopulmonary segment. Enumerate the 'bronchopulmonary segments' of lungs along with their anatomical characteristics and the clinical importance.  
 $3+2+2=7$

3. Write short notes on (any *four*) :

$3 \times 4 = 12$

- (a) Coronary sinus.
- (b) Major openings (normal) of the Diaphragm.
- (c) Inferior horn of lateral ventricle of brain.
- (d) Development of tongue.
- (e) Interior of larynx.

4. Write brief explanatory notes, using your knowledge of anatomy  $3 \times 4 = 12$

A child inhaled a metal foreign body. In X-ray, it was found to be lodged in the right lung. Why do foreign bodies tend to be lodged in the right lung?

- (a) A neglected case of pharyngeal infection may spread to mastoid air cells.
- (b) A young woman with syringomyelia was found to have impairment of appreciation of pain and temperature of upper limbs, but preservation of light touch sensation.
- (c) Following a cerebro-vascular accident, a patient with right sided hemiplegia could not understand the written or spoken language.

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