

## First Professional MBBS Degree Regular/Supplementary Examinations July 2024

### Human Anatomy Paper I

Upper Limb, Head & Neck, Neuroanatomy including General Embryology, General Histology and Genetics

Time: 3 Hours

Total Marks: 100

- Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers
- Indicate the question number correctly for the answer in the margin space
- Answer all parts of a single question together • Leave sufficient space between answers
- Draw table/diagrams/flow charts wherever necessary

#### 1. Multiple Choice Questions

(1x20=20)

The Answers to MCQ questions (Q.No. i to Q.No. xx) shall be written continuously on the first two writing sheets (ie Page No. 3 & 4) only

Questions (i-v) are single response type questions

- i. The ovum is surrounded by a non-cellular layer known as the:
  - a) Corona radiata
  - b) Theca folliculi
  - c) Zona pellucida
  - d) Cumulus oophorus
- ii. Which of the following is an example of a cartilaginous joint
  - a) Humeroulnar joint
  - b) Intervertebral disc joint
  - c) Cranial sutural joint
  - d) Tibiotalar joint
- iii. The chemical used as a preservative in embalming fluid is:
  - a) Formaldehyde
  - b) Nitric acid
  - c) Glycerin
  - d) Thymol
- iv. At the caudal end of the primitive streak, ectoderm and endoderm meet at the:
  - a) Coelom
  - b) Cloacal membrane
  - c) Neural groove
  - d) Notochord
- v. Transection of the lateral spinothalamic tract results in:
  - a) Loss of pain and temperature sensation
  - b) Complete flaccid paralysis
  - c) Spastic paresis
  - d) Cerebellar incoordination

Question (vi-x) are case scenario-based questions:

An 8-year-old boy gives history of chronic middle ear infection. During his recent episode infection spread to the mastoid antrum and the mastoid air cells.

- vi. If left untreated, the infection can erode the thin layer of the bone between the mastoid air cells and the posterior cranial fossa and spread into which of the following sinuses
  - a) Superior sagittal sinus
  - b) Inferior sagittal sinus
  - c) Cavernous sinus
  - d) Sigmoid sinus
- vii. Chronic middle ear infections have produced a lesion in the tympanic plexus in the middle ear cavity which will result in
  - a) Diminished mucus in the nasal cavity
  - b) Diminished mucus on the soft palate
  - c) Diminished saliva production by the parotid gland
  - d) Diminished saliva production by the submandibular and sublingual glands

(PTO)

- viii. The tubotympanic recess, which forms the middle ear cavity develops from
  - a) 1<sup>st</sup> and 2<sup>nd</sup> pharyngeal pouches
  - b) 1<sup>st</sup> pharyngeal pouch
  - c) 1<sup>st</sup> pharyngeal arch
  - d) 3<sup>rd</sup> pharyngeal pouch
- ix. The nerve closely associated with the tympanic membrane is
  - a) Chorda tympani
  - b) Lesser petrosal
  - c) Vestibulocochlear
  - d) Facial
- x. The pyramid gives attachment to
  - a) Stapedius
  - b) Tensor tympani
  - c) Anterior ligament of malleus
  - d) Short process of incus

**Question numbers (xi-xv) consists of two statements - Assertion (A) and Reason (R).**

**Answer these questions by selecting the appropriate options given below.**

- xi. (A): The inferior parathyroid is derived from a more rostral pharyngeal pouch than the superior parathyroid.  
(R): The third pharyngeal pouch contributes to the development of the thyroid gland.
  - a) Both A and R are true, and R is the reason for A
  - b) Both A and R are true, and R is not the reason for A
  - c) A is correct but R is incorrect
  - d) A is incorrect but R is correct
- xii. (A): Skeletal muscle fibers are long cylindrical and multinucleated.  
(R): Each fiber is formed by the fusion of many myoblasts.
  - a) Both A and R are true, and R is the reason for A
  - b) Both A and R are true, and R is not the reason for A
  - c) A is correct but R is incorrect
  - d) A is incorrect but R is correct
- xiii. (A): The axillary vein can freely expand during increased venous return  
(R): There is no or very thin axillary sheath around the axillary vein.
  - a) Both A and R are true, and R is the reason for A
  - b) Both A and R are true, and R is not the reason for A
  - c) A is correct but R is incorrect
  - d) A is incorrect but R is correct
- xiv. (A): Dissection of lymph nodes near the subscapular artery may result in paralysis of the latissimus dorsi muscle.  
(R): The lower subscapular nerve supplies the latissimus dorsi muscle.
  - a) Both A and R are true, and R is the reason for A
  - b) Both A and R are true, and R is not the reason for A
  - c) A is correct but R is incorrect
  - d) A is incorrect but R is correct
- xv. (A): Cerebrospinal fluid is produced in the lateral ventricles of the brain.  
(R): The choroid plexus is situated only in the lateral ventricles.
  - a) Both A and R are true, and R is the reason for A
  - b) Both A and R are true, and R is not the reason for A
  - c) A is correct but R is incorrect
  - d) A is incorrect but R is correct

**Question numbers (xvi-xx) are multiple response type questions. Read the statements and mark the answers appropriately.**

xvi. Origin from neural crest:

- i. Schwann cells
- ii. Neural tube
- iii. Melanoblasts
- iv. Suprarenal medulla

- a) i, ii, iii
- b) i, iii, iv
- c) i, ii, iv
- d) ii, iii

xvii. The nucleus tractus solitarius is concerned with the following cranial nerves

- i. Facial
- ii. Vestibulo-cochlear
- iii. Glossopharyngeal
- iv. Vagus

- a) i, ii, iii
- b) i, iii, iv
- c) i, ii, iv
- d) ii, iii

xviii. Regarding the microscopic structure of lymph node

- i. Cortex, paracortex and medulla can be recognised
- ii. An eccentric arteriole is present within the lymphatic nodules
- iii. A subcapsular sinus can be recognised
- iv. Malpighian corpuscles can be recognised

- a) i, ii, iii
- b) i, iii
- c) i, ii, iv
- d) ii, iii

xix. In the arm

- i. Brachialis may be partly innervated by the radial nerve
- ii. The radial nerve pierces the lateral intermuscular septum above the origin of brachioradialis
- iii. The ulnar nerve pierces the medial intermuscular septum below the insertion of coracobrachialis
- iv. The lateral cutaneous nerve of the forearm is given off by the radial nerve in the spiral groove

- a) i, ii, iii
- b) i, iii, iv
- c) i, ii, iv
- d) ii, iii

xx. Stratified squamous nonkeratinised epithelium is found in

- i. Cornea
- ii. Epiglottis
- iii. Vasdeferens
- iv. Vocal cords

- a) i, ii, iii
- b) i, ii
- c) i, iv
- d) i, ii, iv

**Long essays****(2x10=20)**

2. A 10-year-old girl underwent bilateral tonsillectomy for chronic tonsillitis. On examination, prior to discharge, the surgeon noted an absence of touch sensation on the posterior  $\frac{1}{3}$  of the tongue along with an absent gag reflex. Based on your knowledge of anatomy answer the following questions:
  - a) Name the nerve damaged during the surgery
  - b) What are the external features on the posterior  $\frac{1}{3}$  of tongue
  - c) Correlate the development of the tongue to its nerve supply
  - d) Briefly describe the histology of the tonsil(1+2+4+3)
3. Describe the mammary gland under the following headings: extent, deep relations, gross structure, arterial supply and lymphatics. (1+1+3+2+3)

**Short Essays:****(6x6=36)**

4. Classify white matter of the brain with an example of each. Describe the white matter bundle seen in the median longitudinal cerebral fissure (3+3)
5. Illustrate and describe the microscopic anatomy of the large artery and medium-sized artery highlighting how their structure is suited for their function
6. Describe the process of neurulation. Name the vesicles in the cranial expanded part of the neural tube and mention their fate. (4+2)
7. Describe the structure of chromosomes with classification. Explain any three structural anomalies of chromosomes (4+2)
8. Describe the process of implantation and common abnormal sites of implantation (3+3)
9. Name the layers of the scalp. Why do scalp wounds bleed profusely. Which layer is considered the dangerous layer and why (2+2+2)

**Short Notes****(6x4=24)**

10. Classify synovial joints with an example for each
11. Explain autosomal dominant inheritance in genetic diseases
12. Explain the surgical importance of thyroid gland
13. Explain the anatomical basis of carpal tunnel syndrome
14. Reflect on how to honor and extend gratitude to the cadaver as a Phase 1MBBS student
15. Draw a neat labelled diagram of medulla oblongata at the level of sensory decussation

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