

**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**

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

- 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
 - Superior sagittal sinus
 - Inferior sagittal sinus
 - Cavernous sinus
 - Sigmoid sinus
- Chronic middle ear infections have produced a lesion in the tympanic plexus in the middle ear cavity which will result in
 - Diminished mucus in the nasal cavity
 - Diminished mucus on the soft palate
 - Diminished saliva production by the parotid gland
 - Diminished saliva production by the submandibular and sublingual glands

(PTO)



viii. The tubotympanic recess, which forms the middle ear cavity develops from

- 1st and 2nd pharyngeal pouches
 - 1st pharyngeal pouch
 - 1st pharyngeal arch
 - 3rd pharyngeal pouch
- ix. The nerve closely associated with the tympanic membrane is
- Chorda tympani
 - Lesser petrosal
 - Vestibulocochlear
 - Facial
- x. The pyramid gives attachment to
- Stapedius
 - Tensor tympani
 - Anterior ligament of malleus
 - 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.
- Both A and R are true, and R is the reason for A
 - Both A and R are true, and R is not the reason for A
 - A is correct but R is incorrect
 - 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.
- Both A and R are true, and R is the reason for A
 - Both A and R are true, and R is not the reason for A
 - A is correct but R is incorrect
 - 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.
- Both A and R are true, and R is the reason for A
 - Both A and R are true, and R is not the reason for A
 - A is correct but R is incorrect
 - 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.
- Both A and R are true, and R is the reason for A
 - Both A and R are true, and R is not the reason for A
 - A is correct but R is incorrect
 - 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.
- Both A and R are true, and R is the reason for A
 - Both A and R are true, and R is not the reason for A
 - A is correct but R is incorrect
 - A is incorrect but R is correct

(PTO)



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

(PTO)

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:
- Name the nerve damaged during the surgery
 - What are the external features on the posterior $\frac{1}{3}$ of tongue
 - Correlate the development of the tongue to its nerve supply
 - 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)

- 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)
- Illustrate and describe the microscopic anatomy of the large artery and medium-sized artery highlighting how their structure is suited for their function
- Describe the process of neurulation. Name the vesicles in the cranial expanded part of the neural tube and mention their fate. (4+2)
- Describe the structure of chromosomes with classification. Explain any three structural anomalies of chromosomes (4+2)
- Describe the process of implantation and common abnormal sites of implantation (3+3)
- 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)

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