INI CET Anatomy

Sample Paper – 4

Duration: 45 Minutes **Maximum Marks: 50**

Instructions

- This paper contains **50** Multiple Choice Questions (Single Best Response), modelled on the Anatomy content of **INI CET** (Institutes of National Importance Combined Entrance Test) conducted by AIIMS New Delhi.
- Each correct answer carries **+1 mark**. There is **negative marking of one-third (0.33) mark** for every incorrect answer; unattempted questions carry no penalty.
- Every question has **exactly one best answer**. Choose the single most appropriate option.
- INI CET is a computer-based test taken in fixed 50-question blocks of **45 minutes** each; attempt this practice paper in one timed sitting of about **45 minutes**.
- Use of textbooks, mobile phones, and other electronic gadgets is strictly prohibited during the attempt.

Neuroanatomy

Q1. The corticospinal (pyramidal) tract originates chiefly from the giant pyramidal (Betz) cells that lie in which cortical area?

(A) Postcentral gyrus (Brodmann areas 3, 1, 2)

(B) Precentral gyrus (Brodmann area 4)

(C) Superior temporal gyrus (Brodmann area 41)

(D) Prefrontal cortex (Brodmann area 9)

Q2. About 85% of corticospinal fibres cross to the opposite side to form the lateral corticospinal tract. This crossing occurs at the:

(A) Decussation of the pyramids in the lower medulla

(B) Cerebral peduncle of the midbrain

(C) Each spinal cord segment as the fibres terminate

(D) Genu of the internal capsule

Q3. The lateral corticospinal tract is chiefly responsible for:

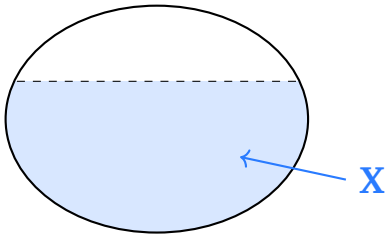
(A) Pain and temperature sensation

(B) Unconscious proprioception to the cerebellum

(C) Fine touch and vibration sense

(D) Voluntary control of skilled movements of the contralateral limbs

Q4. In the cord cross-section below the shaded area shows the territory supplied by the anterior spinal artery. Occlusion of this vessel, which spares the dorsal columns, produces below the lesion:



shaded = anterior spinal artery territory (dorsal aspect at top)

(A) Loss of motor power and of pain and temperature, with vibration and proprioception preserved

(B) Loss of all sensation with motor power fully intact

(C) Loss of vibration and proprioception only

(D) Complete loss of every modality below the lesion

Q5. A young adult has a cape-like loss of pain and temperature over both shoulders with preserved fine touch. The central cavitation of syringomyelia interrupts which fibres as they cross?

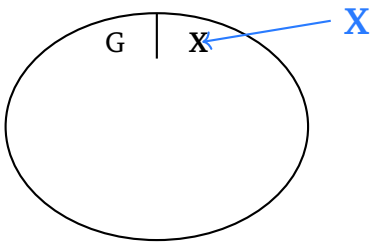
(A) Dorsal column fibres in the fasciculus gracilis

(B) Spinothalamic fibres crossing in the anterior white commissure

(C) Corticospinal fibres in the lateral column

(D) Sensory fibres in the dorsal root entry zone

Q6. In the dorsal columns shown below, sensation from the upper limb (above the T6 level) is carried in the column labelled **X**, which is the:



posterior (dorsal) columns at top; G = fasciculus gracilis

(A) Fasciculus gracilis (medial column)

(B) Lateral spinothalamic tract

(C) Posterior spinocerebellar tract

(D) Fasciculus cuneatus

Q7. Neurosyphilis producing sensory ataxia, loss of vibration and proprioception, and a positive Romberg sign (tabes dorsalis) chiefly degenerates the:

(A) Dorsal columns

(B) Lateral corticospinal tract

(C) Anterior horn cells

(D) Lateral spinothalamic tract

Q8. Which finding indicates an upper motor neuron (UMN) lesion rather than a lower motor neuron lesion?

(A) Marked muscle wasting with fasciculations

(B) Spasticity, hyperreflexia and an extensor plantar (Babinski) response

(C) Flaccid weakness with absent tendon reflexes

(D) Early and severe fibrillation potentials

Q9. Which tract conveys unconscious proprioceptive information from muscle spindles and tendon organs to the cerebellum?

(A) Lateral corticospinal tract

(B) Fasciculus gracilis

(C) Lateral spinothalamic tract

(D) Posterior (dorsal) spinocerebellar tract

Head and Neck

Q10. The maxillary sinus drains into which meatus, its ostium lying high on the medial wall so that natural drainage is poor?

(A) Inferior meatus

(B) Superior meatus

(C) Middle meatus (at the hiatus semilunaris)

(D) Sphenoethmoidal recess

Q11. The frontal sinus opens, by way of the frontonasal duct, into the:

(A) Inferior meatus

(B) Middle meatus

(C) Superior meatus

(D) Sphenoethmoidal recess

Q12. The posterior ethmoidal air cells drain into which part of the nasal cavity?

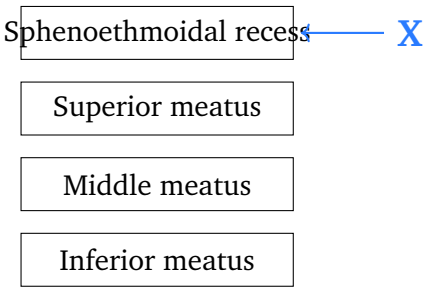
(A) Middle meatus

(B) Inferior meatus

(C) Superior meatus

(D) Sphenoethmoidal recess

Q13. The diagram lists the drainage sites on the lateral wall of the nose. The sphenoid air sinus drains into the site marked **X**, which is the:



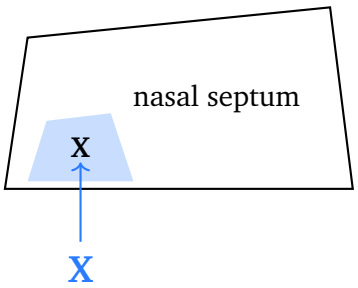
(A) Middle meatus

(B) Sphenoethmoidal recess

(C) Inferior meatus

(D) Superior meatus

Q14. In the diagram of the nasal septum, the shaded anteroinferior region marked **X** (Little's area), the commonest site of anterior epistaxis, contains an arterial anastomosis called:



(A) Kiesselbach's plexus

(B) Pterygoid venous plexus

(C) The circle of Willis

(D) Batson's vertebral venous plexus

Q15. The nasolacrimal duct carries tears from the lacrimal sac into which meatus of the nasal cavity?

(A) Middle meatus

(B) Superior meatus

(C) Inferior meatus

(D) Sphenoethmoidal recess

Q16. The olfactory nerve fibres reach the olfactory bulb by passing through which bony structure?

(A) Foramen rotundum

(B) Optic canal

(C) Cribriform plate of the ethmoid bone

(D) Superior orbital fissure

Upper and Lower Limb

Q17. A knock to the "funny bone" behind the medial epicondyle, within the cubital tunnel, tingles the little finger. Injury here affects which nerve, and its chronic damage produces a claw hand?

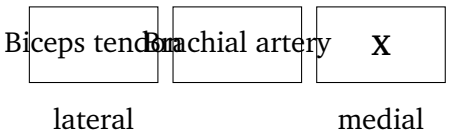
(A) Ulnar nerve

(B) Median nerve

(C) Radial nerve

(D) Musculocutaneous nerve

Q18. The box row shows the contents of the cubital fossa from lateral to medial. The most medial content, marked **X**, is the:



(A) Median nerve

(B) Brachial artery

(C) Biceps tendon

(D) Radial nerve

Q19. Forearm ache with weakness of the forearm flexors and thenar muscles, brought on where the nerve passes between the two heads of pronator teres, is caused by:

(A) Radial nerve palsy causing wrist drop

(B) Compression of the median nerve (pronator teres syndrome)

(C) Ulnar nerve palsy causing a claw hand

(D) Long thoracic nerve palsy causing a winged scapula

Q20. Within the cubital fossa the brachial artery ends by dividing into which two arteries?

(A) Radial and ulnar arteries

(B) Radial and common interosseous arteries

(C) Ulnar artery and profunda brachii

(D) Anterior and posterior interosseous arteries

Q21. A supracondylar fracture of the humerus in a child may tear the brachial artery; unrelieved ischaemia of the forearm flexor compartment leads to:

(A) Volkmann's ischaemic contracture

(B) Erb's palsy

(C) Dupuytren's contracture

(D) Klumpke's palsy

Q22. The fibres of the interosseous membrane of the forearm run mainly:

(A) Vertically, parallel to the long axis of the bones

(B) Horizontally, straight across between the two bones

(C) Obliquely upwards, from the ulna to the radius

(D) Obliquely downwards and medially, from the radius to the ulna

Q23. The biceps brachii tendon (jerk) reflex tests principally which spinal cord segments?

(A) C7 and C8

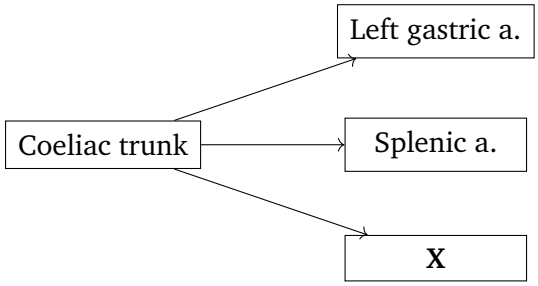
(B) C8 and T1

(C) C5 and C6

(D) L3 and L4

Thorax, Abdomen and Pelvis

Q24. The diagram shows the three branches of the coeliac trunk. The branch marked **X**, which further gives the hepatic and gastroduodenal arteries, is the:



(A) Superior mesenteric artery

(B) Right gastric artery

(C) Gastroduodenal artery

(D) Common hepatic artery

Q25. The lesser curvature of the stomach is supplied by the left gastric artery, which anastomoses along it with the:

(A) Right gastric artery

(B) Right gastro-epiploic artery

(C) Short gastric arteries

(D) Splenic artery

Q26. The greater curvature of the stomach is supplied by the right and left gastro-epiploic (gastro-omental) arteries. The left gastro-epiploic artery is a branch of the:

(A) Common hepatic artery

(B) Left gastric artery

(C) Superior mesenteric artery

(D) Splenic artery

Q27. The short gastric arteries supplying the fundus of the stomach arise from the:

(A) Left gastric artery

(B) Right gastric artery

(C) Common hepatic artery

(D) Splenic artery

Q28. The lesser omentum is made up of two ligaments – the hepatogastric ligament and the:

(A) Gastrosplenic ligament

(B) Splenorenal ligament

(C) Hepatoduodenal ligament

(D) Falciform ligament

Q29. Which of the following structures forms part of the stomach bed (the structures behind the stomach on which it rests)?

(A) The liver

(B) The anterior abdominal wall

(C) The anterior surface of the transverse colon

(D) The pancreas

Q30. Sympathetic and visceral pain fibres from foregut derivatives such as the stomach relay in the coeliac ganglion after travelling in the:

(A) Lesser splanchnic nerve

(B) Greater splanchnic nerve

(C) Least splanchnic nerve

(D) Lumbar splanchnic nerves

Embryology

Q31. During development the metanephric kidney ascends from the pelvis, changing its blood supply, to reach its final position at about vertebral level:

(A) First lumbar vertebra (L1)

(B) Fourth lumbar vertebra (L4)

(C) Second sacral vertebra (S2)

(D) Tenth thoracic vertebra (T10)

Q32. A horseshoe kidney fails to ascend fully because its fused lower poles are caught beneath the:

(A) Superior mesenteric artery

(B) Inferior mesenteric artery

(C) Coeliac trunk

(D) Bifurcation of the aorta

Q33. The correct developmental sequence of the three sets of kidneys, in time order, is:

(A) Metanephros $\rightarrow$ mesonephros $\rightarrow$ pronephros

(B) Mesonephros $\rightarrow$ pronephros $\rightarrow$ metanephros

(C) Pronephros $\rightarrow$ mesonephros $\rightarrow$ metanephros

(D) Pronephros $\rightarrow$ metanephros $\rightarrow$ mesonephros

Q34. In the male the mesonephric (Wolffian) duct gives rise to the epididymis, vas deferens and the:

(A) Prostate gland

(B) Uterus

(C) Seminal vesicle

(D) Bulbourethral gland

Q35. The paramesonephric (Mullerian) ducts give rise to the uterine tubes, the uterus and the:

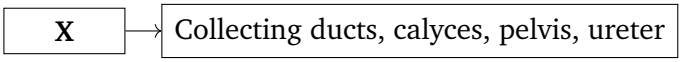
(A) Upper (proximal) part of the vagina

(B) Urinary bladder

(C) Lower vagina and vestibule

(D) Ovary

Q36. In the diagram, the collecting ducts, calyces, pelvis and ureter all arise from the structure marked **X**, which is the:



(A) Metanephric blastema

(B) Ureteric bud

(C) Mesonephric tubule

(D) Paramesonephric duct

Q37. Hypospadias, in which the urethral opening lies on the ventral surface of the penis, results from failure of fusion of the:

(A) Labioscrotal swellings

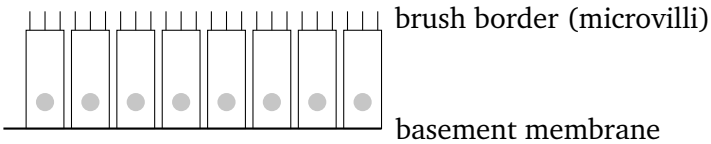
(B) Two halves of the genital tubercle

(C) Urethral (urogenital) folds

(D) Palatine shelves

Histology

Q38. The schematic shows a single layer of tall cells with basal nuclei and an apical brush border of microvilli, typical of the absorptive lining of the small intestine. This epithelium is:



(A) Simple squamous epithelium

(B) Stratified squamous epithelium

(C) Transitional epithelium

(D) Simple columnar epithelium

Q39. Which muscle type is made of spindle-shaped cells, each with a single central nucleus and no cross-striations?

(A) Skeletal muscle

(B) Smooth muscle

(C) Cardiac muscle

(D) Striated myoepithelium

Q40. The intervertebral discs and the menisci of the knee are made of which cartilage, rich in type I collagen?

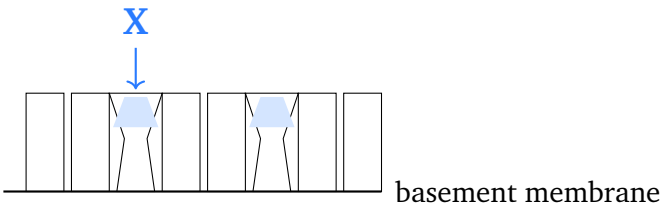
(A) Hyaline cartilage

(B) Fibrocartilage

(C) Elastic cartilage

(D) Calcified cartilage

Q41. In the intestinal epithelium below, the wine-glass-shaped cell marked **X**, which secretes mucus, is a:



(A) Paneth cell

(B) Enteroendocrine cell

(C) Chief cell

(D) Goblet cell

Q42. Renin is secreted by the modified smooth-muscle cells of the afferent arteriole that, together with the macula densa, form the:

(A) Juxtaglomerular apparatus

(B) Loop of Henle

(C) Bowman's capsule

(D) Peritubular capillary bed

Q43. Within the seminiferous tubule, the cells that form the blood-testis barrier and respond to follicle-stimulating hormone (FSH) are the:

(A) Leydig (interstitial) cells

(B) Spermatogonia

(C) Sertoli cells

(D) Peritubular myoid cells

Genetics and Cytogenetics

Q44. A high-pitched cat-like cry, microcephaly and intellectual disability in an infant point to a deletion of the short arm (p) of chromosome:

(A) Chromosome 15

(B) Chromosome 21

(C) Chromosome 4

(D) Chromosome 5

Q45. A child with neonatal hypotonia followed by hyperphagia, obesity and hypogonadism has a deletion of the paternally derived 15q11-q13 region (genomic imprinting). This condition is:

(A) Angelman syndrome

(B) Prader-Willi syndrome

(C) Cri-du-chat syndrome

(D) Down syndrome

Q46. Intellectual disability with a long face, large ears and macro-orchidism, caused by CGG trinucleotide repeat expansion in the FMR1 gene, is:

(A) Klinefelter syndrome

(B) Huntington disease

(C) Fragile X syndrome

(D) Prader-Willi syndrome

Q47. A karyotype of 47,XXX (triple X) typically produces a phenotype that is:

(A) A phenotypically normal female, often tall and usually fertile

(B) A phenotypic male with small firm testes

(C) A short female with a webbed neck

(D) An infertile male with gynaecomastia

Osteology and Radiological Anatomy

Q48. A fall on the outstretched hand in an elderly woman produces a "dinner-fork" deformity of the wrist. This is a fracture of the:

(A) Scaphoid bone

(B) Distal radius (Colles fracture)

(C) Distal ulna alone

(D) Lunate bone

Q49. Which of the following structures passes through the foramen magnum?

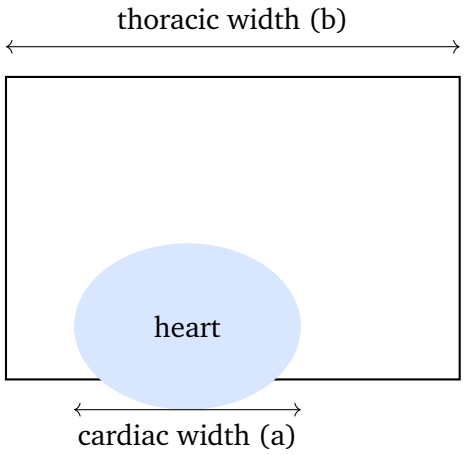
(A) The internal carotid artery

(B) The glossopharyngeal nerve

(C) The spinal roots of the accessory nerve

(D) The trunk of the hypoglossal nerve

Q50. On the PA chest radiograph below, the cardiothoracic ratio is the cardiac width (a) divided by the thoracic width (b). Cardiomegaly is diagnosed when this ratio exceeds:



(A) 0.30

(B) 0.40

(C) 0.45

(D) 0.50 (50%)

Detailed Solutions

Q1.

Solution

Concept – origin of the pyramidal tract: The corticospinal tract is the great voluntary motor pathway to the spinal cord.

Step 1 – locate the cells of origin: Its largest fibres arise from the giant pyramidal (Betz) cells in the fifth cortical layer of the **precentral gyrus**, which is Brodmann area 4, the primary motor cortex.

Step 2 – add the wider origin: Many more fibres also come from the premotor and postcentral areas, but the Betz cells define the classic origin in the precentral gyrus.

Why the other options are wrong:

- A, Postcentral gyrus: the primary somatosensory cortex, a sensory area.
- C, Superior temporal gyrus: houses the primary auditory cortex.
- D, Prefrontal cortex: concerned with planning and behaviour, not direct motor output.

Final Answer: Precentral gyrus (area 4) $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q1

Q2.

Solution

Concept – the pyramidal decussation: Most corticospinal fibres cross the midline before descending in the cord.

Step 1 – name the crossing point: About 85% of the fibres cross at the **decussation of the pyramids** in the lower (caudal) medulla.

Step 2 – state the result: These crossed fibres descend as the lateral corticospinal tract on the opposite side; the small uncrossed remainder forms the anterior corticospinal tract.

Why the other options are wrong:

- B, Midbrain: the fibres pass through the cerebral peduncle here but do not cross.
- C, Each spinal segment: only the uncrossed anterior tract fibres cross late, segment by segment.

- D, Internal capsule: the fibres are still descending uncrossed at this level.

Final Answer: Decussation of the pyramids in the lower medulla $\Rightarrow$ A

Answer: (A) Go Back to Q2

Q3.

Solution

Concept – function of the lateral corticospinal tract: It is a descending motor pathway, not a sensory one.

Step 1 – state its job: The lateral corticospinal tract carries **voluntary commands for skilled, precise movements** of the contralateral limbs, especially the distal muscles of the hand.

Step 2 – link to its origin: Because it has already crossed in the medulla, one motor cortex controls the opposite side of the body.

Why the other options are wrong:

- A, Pain and temperature: carried by the ascending spinothalamic tract.
- B, Unconscious proprioception: carried by the spinocerebellar tracts.
- C, Fine touch and vibration: carried by the dorsal columns.

Final Answer: Voluntary skilled movement of the contralateral limbs $\Rightarrow$ D

Answer: (D) Go Back to Q3

Q4.

Solution

Concept – anterior spinal artery syndrome: The anterior spinal artery supplies the anterior two-thirds of the cord, sparing the dorsal columns.

Step 1 – list the damaged tracts: The infarct destroys the corticospinal tracts (motor) and the spinothalamic tracts (pain and temperature).

Step 2 – state what is spared: The dorsal columns, fed by the posterior spinal arteries, survive, so vibration and proprioception are preserved.

Why the other options are wrong:

- B, All sensation lost with intact motor: the reverse of the true picture.
- C, Vibration and proprioception loss only: those are the modalities that are spared.

- D, Complete loss of every modality: would require a complete cord transection.

Final Answer: Motor and pain/temperature loss with preserved proprioception $\Rightarrow$ A

Answer: (A) Go Back to Q4

Q5.

Solution

Concept – syringomyelia: A fluid-filled cavity expands in the centre of the cord, usually in the cervical region.

Step 1 – identify the fibres hit first: The cavity first interrupts the **spinothalamic fibres as they decussate in the anterior white commissure**, just in front of the central canal.

Step 2 – explain the sign: This gives a bilateral, cape-like loss of pain and temperature over the shoulders and arms, while dorsal-column touch is spared (dissociated sensory loss).

Why the other options are wrong:

- A, Dorsal column fibres: spared early, so touch is preserved.
- C, Corticospinal fibres: affected only later, once the cavity enlarges.
- D, Dorsal root entry zone: not the site of the classic dissociated loss.

Final Answer: Spinothalamic fibres in the anterior white commissure $\Rightarrow$ B

Answer: (B) Go Back to Q5

Q6.

Solution

Concept – somatotopy of the dorsal columns: The dorsal columns are split into a medial and a lateral part.

Step 1 – identify column X: The lateral part, present only above T6, is the **fasciculus cuneatus**, carrying fine touch and proprioception from the **upper limb** and upper trunk.

Step 2 – contrast with gracilis: The medial fasciculus gracilis (G in the figure) carries the same modalities from the lower limb and lower trunk.

Why the other options are wrong:

- A, Fasciculus gracilis: the medial column, serving the lower limb.
- B, Lateral spinothalamic tract: lies in the lateral column, not the dorsal column.
- C, Posterior spinocerebellar tract: also lateral, carrying unconscious proprioception.

Final Answer: Fasciculus cuneatus $\Rightarrow$ D

Answer: (D) Go Back to Q6

Q7.

Solution

Concept – tabes dorsalis: Late (tertiary) neurosyphilis attacks a specific part of the cord.

Step 1 – name the degenerated tract: Tabes dorsalis degenerates the **dorsal columns** and the dorsal roots.

Step 2 – link to the signs: Loss of vibration and proprioception produces sensory ataxia and a positive Romberg sign (worse with the eyes closed).

Why the other options are wrong:

- B, Lateral corticospinal tract: its loss would give spastic weakness, not sensory ataxia.
- C, Anterior horn cells: their loss gives flaccid, wasting paralysis.
- D, Lateral spinothalamic tract: its loss removes pain and temperature, not proprioception.

Final Answer: Dorsal columns $\Rightarrow$ A

Answer: (A) Go Back to Q7

Q8.

Solution

Concept – upper versus lower motor neuron signs: A UMN lesion removes descending inhibition, whereas an LMN lesion cuts the muscle's only supply.

Step 1 – list UMN features: Spasticity, hyperreflexia and an extensor plantar (Babinski) response, with little wasting.

Step 2 – contrast with LMN: An LMN lesion gives flaccid weakness, marked wasting, fasciculations and absent reflexes.

Why the other options are wrong:

- A, Wasting with fasciculations: a lower motor neuron feature.
- C, Flaccidity with absent reflexes: a lower motor neuron feature.
- D, Fibrillation potentials: seen on EMG in denervation (lower motor neuron).

Final Answer: Spasticity, hyperreflexia and extensor plantar $\Rightarrow$ B

Answer: (B) Go Back to Q8

Q9.

Solution

Concept – unconscious proprioception: Proprioceptive data for coordination reach the cerebellum without reaching consciousness.

Step 1 – name the tract: The **posterior (dorsal) spinocerebellar tract** carries this information from muscle spindles and Golgi tendon organs.

Step 2 – confirm the destination: It ascends uncrossed to the cerebellum through the inferior cerebellar peduncle.

Why the other options are wrong:

- A, Lateral corticospinal tract: a descending motor tract.
- B, Fasciculus gracilis: carries conscious touch and proprioception to the cortex.
- C, Lateral spinothalamic tract: carries pain and temperature.

Final Answer: Posterior spinocerebellar tract $\Rightarrow$ D

Answer: (D) Go Back to Q9

Q10.

Solution

Concept – drainage of the paranasal sinuses: Each sinus drains to a defined point on the lateral nasal wall.

Step 1 – place the maxillary ostium: The maxillary sinus opens into the **middle meatus** at the hiatus semilunaris.

Step 2 – note the clinical catch: Its ostium sits high on the medial wall, so gravity does not aid drainage and sinusitis is common.

Why the other options are wrong:

- A, Inferior meatus: receives the nasolacrimal duct.
- B, Superior meatus: receives the posterior ethmoidal cells.
- D, Sphenoethmoidal recess: receives the sphenoid sinus.

Final Answer: Middle meatus ⇒ C

Answer: (C) Go Back to Q10

Q11.

Solution

Concept – frontal sinus drainage: The frontal sinus drains downwards through a narrow duct.

Step 1 – follow the duct: The frontonasal duct carries it into the **middle meatus**, via the ethmoidal infundibulum.

Step 2 – group the neighbours: The frontal, maxillary and anterior ethmoidal sinuses all drain into the middle meatus.

Why the other options are wrong:

- A, Inferior meatus: takes the nasolacrimal duct.
- C, Superior meatus: takes the posterior ethmoidal cells.
- D, Sphenoethmoidal recess: takes the sphenoid sinus.

Final Answer: Middle meatus ⇒ B

Answer: (B) Go Back to Q11

Q12.

Solution

Concept – ethmoidal air cells: The ethmoidal cells are grouped as anterior, middle and posterior.

Step 1 – locate the posterior group: The **posterior ethmoidal cells** drain into the **superior meatus**.

Step 2 – contrast the others: The anterior and middle ethmoidal cells drain into

the middle meatus.

Why the other options are wrong:

- A, Middle meatus: receives the anterior and middle ethmoidal cells.
- B, Inferior meatus: receives the nasolacrimal duct.
- D, Sphenoethmoidal recess: receives the sphenoid sinus.

Final Answer: Superior meatus ⇒ C

Answer: (C) Go Back to Q12

Q13.

Solution

Concept – sphenoid sinus drainage: The sphenoid sinus lies above and behind the nasal cavity.

Step 1 – read the figure at X: The top box is the **sphenoethmoidal recess**, above the superior concha, and this is where the sphenoid sinus drains.

Step 2 – confirm the level: It is the only sinus that does not open into one of the three meatuses.

Why the other options are wrong:

- A, Middle meatus: for the maxillary, frontal and anterior ethmoidal sinuses.
- C, Inferior meatus: for the nasolacrimal duct.
- D, Superior meatus: for the posterior ethmoidal cells.

Final Answer: Sphenoethmoidal recess ⇒ B

Answer: (B) Go Back to Q13

Q14.

Solution

Concept – blood supply of the nasal septum: Several arteries meet on the anteroinferior septum.

Step 1 – name the anastomosis: This is Little's area, where the anastomosis is called **Kiesselbach's plexus**.

Step 2 – list the contributors: It is fed by the anterior ethmoidal, sphenopalatine, greater palatine and superior labial arteries, and is the commonest source of

anterior epistaxis.

Why the other options are wrong:

- B, Pterygoid venous plexus: a vein network in the infratemporal fossa.
- C, Circle of Willis: the arterial ring at the base of the brain.
- D, Batson's plexus: the valveless vertebral venous plexus.

Final Answer: Kiesselbach's plexus $\Rightarrow$ A

Answer: (A) Go Back to Q14

Q15.

Solution

Concept – nasolacrimal drainage: Tears pass from the eye to the nose through the nasolacrimal duct.

Step 1 – name the meatus: The duct opens into the **inferior meatus**, beneath the inferior concha.

Step 2 – clinical note: This is why crying makes the nose run and why the duct can be probed through the inferior meatus.

Why the other options are wrong:

- A, Middle meatus: for the maxillary and frontal sinuses.
- B, Superior meatus: for the posterior ethmoidal cells.
- D, Sphenoethmoidal recess: for the sphenoid sinus.

Final Answer: Inferior meatus $\Rightarrow$ C

Answer: (C) Go Back to Q15

Q16.

Solution

Concept – course of the olfactory nerve: The first cranial nerve is really many short filaments.

Step 1 – name the bony passage: The olfactory filaments pass through the **cribriform plate of the ethmoid** to reach the olfactory bulb.

Step 2 – clinical link: A fracture of the cribriform plate can tear these filaments (anosmia) and leak cerebrospinal fluid into the nose.

Why the other options are wrong:

- A, Foramen rotundum: transmits the maxillary nerve.
- B, Optic canal: transmits the optic nerve.
- D, Superior orbital fissure: transmits the nerves to the eye muscles.

Final Answer: Cribriform plate of the ethmoid $\Rightarrow$ C

Answer: (C) Go Back to Q16

Q17.

Solution

Concept – ulnar nerve at the elbow: The ulnar nerve is superficial behind the medial epicondyle in the cubital tunnel.

Step 1 – name the nerve: A knock here strikes the **ulnar nerve**, giving the familiar tingling of the little and ring fingers.

Step 2 – recall the chronic deformity: Long-standing damage weakens the intrinsic hand muscles and produces the ulnar claw hand.

Why the other options are wrong:

- B, Median nerve: compressed at the carpal tunnel or between the pronator heads.
- C, Radial nerve: injured in the spiral groove of the humerus.
- D, Musculocutaneous nerve: supplies the arm flexors, not the funny bone.

Final Answer: Ulnar nerve $\Rightarrow$ A

Answer: (A) Go Back to Q17

Q18.

Solution

Concept – contents of the cubital fossa: From lateral to medial the contents are remembered as "TAN": Tendon, Artery, Nerve.

Step 1 – identify X: The most medial content is the **median nerve**.

Step 2 – order the rest: The biceps tendon is most lateral, then the brachial artery, then the median nerve most medial.

Why the other options are wrong:

- B, Brachial artery: lies between the tendon and the nerve, not most medial.
- C, Biceps tendon: the most lateral content.
- D, Radial nerve: lies outside the fossa, under brachioradialis.

Final Answer: Median nerve $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q18

Q19.

Solution

Concept – pronator teres syndrome: The median nerve can be trapped as it dives between the two heads of pronator teres.

Step 1 – name the entrapment: Compression here gives **pronator teres syndrome**, with aching in the forearm and weakness of the median-supplied flexors and thenar muscles.

Step 2 – distinguish from carpal tunnel: Unlike carpal tunnel syndrome, the forearm pain is prominent and there is no night-time predominance.

Why the other options are wrong:

- A, Wrist drop: a radial nerve sign.
- C, Claw hand: an ulnar nerve sign.
- D, Winged scapula: a long thoracic nerve sign.

Final Answer: Median nerve compression (pronator teres syndrome) $\Rightarrow$ $\boxed{B}$

Answer: (B) Go Back to Q19

Q20.

Solution

Concept – termination of the brachial artery: The brachial artery ends in the cubital fossa.

Step 1 – name the two branches: At the level of the neck of the radius it divides into the **radial and ulnar arteries**.

Step 2 – trace them: The radial artery runs down the lateral forearm; the ulnar artery runs medially and gives the common interosseous artery.

Why the other options are wrong:

- B, Radial and common interosseous: the interosseous is a branch of the

ulnar, not a direct division.

- C, Ulnar and profunda brachii: the profunda brachii arises higher up in the arm.
- D, Anterior and posterior interosseous: these are sub-branches of the common interosseous.

Final Answer: Radial and ulnar arteries ⇒ A

Answer: (A) Go Back to Q20

Q21.

Solution

Concept – supracondylar fracture complications: The sharp proximal fragment can catch the brachial artery.

Step 1 – trace the sequence: Arterial injury starves the forearm flexor compartment of blood, and the ischaemic muscles undergo fibrosis and shortening.

Step 2 – name the outcome: This is **Volkmann's ischaemic contracture**, a permanent flexion deformity of the wrist and fingers.

Why the other options are wrong:

- B, Erb's palsy: an upper brachial plexus (C5–C6) injury.
- C, Dupuytren's contracture: a palmar fascia disease, unrelated to fracture.
- D, Klumpke's palsy: a lower plexus (C8–T1) injury.

Final Answer: Volkmann's ischaemic contracture ⇒ A

Answer: (A) Go Back to Q21

Q22.

Solution

Concept – the interosseous membrane: This fibrous sheet ties the radius to the ulna and transmits load.

Step 1 – state the fibre direction: Its main fibres run **obliquely downwards and medially, from the radius to the ulna**.

Step 2 – explain the function: This slant transfers force from the hand and radius across to the ulna and then the humerus during a fall.

Why the other options are wrong:

- A, Vertically: would not transmit load between the bones.
- B, Horizontally: not the true oblique arrangement.
- C, From the ulna to the radius: the direction is the reverse of this.

Final Answer: Obliquely downwards from the radius to the ulna $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q22

Q23.

Solution

Concept – tendon reflex segments: Each deep tendon reflex maps to specific cord segments.

Step 1 – give the biceps reflex level: The biceps jerk tests the **C5 and C6** segments, through the musculocutaneous nerve.

Step 2 – compare the others: The triceps jerk is C7–C8 and the knee jerk is L3–L4.

Why the other options are wrong:

- A, C7 and C8: the level of the triceps reflex.
- B, C8 and T1: the level of the finger flexors, not the biceps.
- D, L3 and L4: the level of the knee (patellar) reflex.

Final Answer: C5 and C6 $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q23

Q24.

Solution

Concept – branches of the coeliac trunk: The coeliac trunk supplies the foregut through three branches.

Step 1 – identify branch X: The branch that goes on to form the hepatic and gastroduodenal arteries is the **common hepatic artery**.

Step 2 – name the three together: The coeliac trunk gives the left gastric, splenic and common hepatic arteries.

Why the other options are wrong:

- A, Superior mesenteric artery: a separate midgut vessel, not a coeliac branch.
- B, Right gastric artery: usually a branch of the hepatic artery proper.

- C, Gastroduodenal artery: a branch of the common hepatic, not the trunk itself.

Final Answer: Common hepatic artery $\Rightarrow$ D

Answer: (D) Go Back to Q24

Q25.

Solution

Concept – arteries of the lesser curvature: The lesser curvature has its own arterial arcade.

Step 1 – name the partner artery: The left gastric artery meets the **right gastric artery** along the lesser curvature.

Step 2 – trace the origins: The left gastric comes from the coeliac trunk; the right gastric usually comes from the hepatic artery.

Why the other options are wrong:

- B, Right gastro-epiploic artery: runs along the greater curvature.
- C, Short gastric arteries: supply the fundus, not the lesser curvature.
- D, Splenic artery: runs to the spleen along the top of the pancreas.

Final Answer: Right gastric artery $\Rightarrow$ A

Answer: (A) Go Back to Q25

Q26.

Solution

Concept – arteries of the greater curvature: The greater curvature is served by the two gastro-epiploic arteries.

Step 1 – trace the left gastro-epiploic: The **left gastro-epiploic artery** arises from the **splenic artery**.

Step 2 – complete the arcade: It anastomoses along the greater curvature with the right gastro-epiploic artery (from the gastroduodenal).

Why the other options are wrong:

- A, Common hepatic artery: gives the gastroduodenal, which feeds the right gastro-epiploic instead.
- B, Left gastric artery: supplies the lesser curvature.

- C, Superior mesenteric artery: supplies the midgut.

Final Answer: Splenic artery $\Rightarrow$ D

Answer: (D) Go Back to Q26

Q27.

Solution

Concept – supply of the gastric fundus: The fundus is reached by small arteries from a nearby trunk.

Step 1 – name the source: The short gastric arteries arise from the **splenic artery** (and its splenic branches) and run in the gastrosplenic ligament.

Step 2 – clinical relevance: They are divided during splenectomy and can bleed if not secured.

Why the other options are wrong:

- A, Left gastric artery: supplies the upper lesser curvature.
- B, Right gastric artery: supplies the lower lesser curvature.
- C, Common hepatic artery: runs to the liver and duodenum.

Final Answer: Splenic artery $\Rightarrow$ D

Answer: (D) Go Back to Q27

Q28.

Solution

Concept – the lesser omentum: It is a double fold of peritoneum running from the liver to the stomach and duodenum.

Step 1 – name its two parts: It comprises the hepatogastric ligament and the **hepatoduodenal ligament**.

Step 2 – note the contents: The free edge (hepatoduodenal ligament) carries the portal triad: portal vein, hepatic artery and bile duct.

Why the other options are wrong:

- A, Gastrosplenic ligament: part of the greater omentum, from stomach to spleen.
- B, Splenorenal ligament: from spleen to the posterior wall, carrying the splenic vessels.

- D, Falciform ligament: attaches the liver to the anterior abdominal wall.

Final Answer: Hepatoduodenal ligament ⇒ C

Answer: (C) Go Back to Q28

Q29.

Solution

Concept – the stomach bed: The stomach bed is the set of structures behind the stomach and the lesser sac.

Step 1 – pick the correct structure: The **pancreas** lies in the stomach bed, along with the left kidney, left suprarenal gland, spleen, splenic artery, left crus of the diaphragm and transverse mesocolon.

Step 2 – reason it out: These posterior structures are separated from the stomach by the lesser sac.

Why the other options are wrong:

- A, Liver: lies to the right and in front of the stomach, not behind it.
- B, Anterior abdominal wall: lies in front of the stomach.
- C, Anterior surface of the transverse colon: it is the transverse mesocolon, not the colon's front, that forms part of the bed.

Final Answer: Pancreas ⇒ D

Answer: (D) Go Back to Q29

Q30.

Solution

Concept – foregut sympathetic supply: Foregut organs share a common sympathetic route.

Step 1 – name the nerve: Preganglionic fibres from T5–T9 form the **greater splanchnic nerve**, which relays in the coeliac ganglion.

Step 2 – link to pain: Visceral pain from the stomach travels back along this route and is referred to the epigastrium.

Why the other options are wrong:

- A, Lesser splanchnic nerve: T10–T11, supplying the midgut.
- C, Least splanchnic nerve: T12, to the renal plexus.

- D, Lumbar splanchnic nerves: supply the hindgut and pelvic organs.

Final Answer: Greater splanchnic nerve $\Rightarrow$ B

Answer: (B) Go Back to Q30

Q31.

Solution

Concept – ascent of the kidney: The definitive kidney starts low in the pelvis and climbs.

Step 1 – give the final level: It comes to rest with its hilum at about the **first lumbar vertebra (L1)**.

Step 2 – explain the changing supply: As it ascends, it is fed by a succession of arteries from the aorta, the lowest of which normally disappear, leaving the definitive renal artery.

Why the other options are wrong:

- B, L4: too low; the kidney has already passed this level.
- C, S2: the pelvic level from which it starts, not where it ends.
- D, T10: too high for the normal kidney.

Final Answer: First lumbar vertebra (L1) $\Rightarrow$ A

Answer: (A) Go Back to Q31

Q32.

Solution

Concept – horseshoe kidney: Fusion of the lower poles limits the kidney's ascent.

Step 1 – name the obstacle: The fused isthmus is caught beneath the **inferior mesenteric artery** as the kidney tries to climb.

Step 2 – state the result: The horseshoe kidney therefore sits lower than normal, in the lower lumbar region.

Why the other options are wrong:

- A, Superior mesenteric artery: arises higher, above the normal resting level.
- C, Coeliac trunk: even higher, at T12.
- D, Bifurcation of the aorta: lies below the isthmus, so it is not the hooking point.

Final Answer: Inferior mesenteric artery $\Rightarrow$ B

Answer: (B) Go Back to Q32

Q33.

Solution

Concept – three sets of kidneys: The kidney develops in three overlapping stages.

Step 1 – give the order: The sequence is **pronephros** $\rightarrow$ **mesonephros** $\rightarrow$ **metanephros**.

Step 2 – note the fate: The pronephros regresses, the mesonephros mostly regresses (leaving male genital ducts), and the metanephros becomes the permanent kidney.

Why the other options are wrong:

- A, Reverses the true order.
- B, Places the mesonephros before the pronephros, which is incorrect.
- D, Places the metanephros before the mesonephros, which is incorrect.

Final Answer: Pronephros $\rightarrow$ mesonephros $\rightarrow$ metanephros $\Rightarrow$ C

Answer: (C) Go Back to Q33

Q34.

Solution

Concept – mesonephric (Wolffian) duct derivatives: In the male this duct forms the genital ducts.

Step 1 – complete the list: It gives the epididymis, vas deferens and the **seminal vesicle** (and the ejaculatory duct).

Step 2 – note the trigger: Testosterone from the fetal testis drives this development.

Why the other options are wrong:

- A, Prostate gland: develops from the urogenital sinus endoderm.
- B, Uterus: a paramesonephric (Mullerian) derivative in the female.
- D, Bulbourethral gland: arises from the urogenital sinus.

Final Answer: Seminal vesicle $\Rightarrow$ C

Answer: (C) Go Back to Q34

Q35.

Solution

Concept – paramesonephric (Mullerian) duct derivatives: These ducts form the female genital tract.

Step 1 – complete the list: They give the uterine tubes, the uterus and the **upper part of the vagina**.

Step 2 – note the lower vagina: The lower vagina comes from the sinovaginal bulbs of the urogenital sinus, not the ducts.

Why the other options are wrong:

- B, Urinary bladder: develops from the urogenital sinus.
- C, Lower vagina and vestibule: urogenital sinus derivatives.
- D, Ovary: develops from the gonadal ridge, not the ducts.

Final Answer: Upper part of the vagina $\Rightarrow$ A

Answer: (A) Go Back to Q35

Q36.

Solution

Concept – two origins of the kidney: The nephron and the collecting system come from different tissues.

Step 1 – identify X: The **ureteric bud**, an outgrowth of the mesonephric duct, forms the collecting ducts, calyces, pelvis and ureter.

Step 2 – name the partner: The metanephric blastema (cap) forms the nephrons, from glomerulus to distal convoluted tubule.

Why the other options are wrong:

- A, Metanephric blastema: forms the nephrons, not the collecting system.
- C, Mesonephric tubule: regresses or forms parts of the male genital ducts.
- D, Paramesonephric duct: forms female genital structures.

Final Answer: Ureteric bud $\Rightarrow$ B

Answer: (B) Go Back to Q36

Q37.

Solution

Concept – hypospadias: The male urethra is completed by fusion of the urethral folds along the ventral penis.

Step 1 – name the failure: Hypospadias is due to incomplete fusion of the **urethral (urogenital) folds**.

Step 2 – state the result: The urethra opens on the ventral (under) surface of the penis rather than at the tip.

Why the other options are wrong:

- A, Labioscrotal swellings: their failure gives a bifid scrotum, not hypospadias.
- B, Halves of the genital tubercle: not the mechanism of hypospadias.
- D, Palatine shelves: relate to cleft palate, in the head.

Final Answer: Urethral folds $\Rightarrow$ C

Answer: (C) Go Back to Q37

Q38.

Solution

Concept – reading an intestinal epithelium: The figure shows one layer of tall cells with basal nuclei.

Step 1 – classify it: A single row of tall cells is **simple columnar epithelium**.

Step 2 – add the specialisation: The apical microvilli form the striated brush border that greatly increases the absorptive surface.

Why the other options are wrong:

- A, Simple squamous: a single layer of flat cells (as in alveoli).
- B, Stratified squamous: many layers, lining the skin and oesophagus.
- C, Transitional: lines the urinary tract and stretches.

Final Answer: Simple columnar epithelium $\Rightarrow$ D

Answer: (D) Go Back to Q38

Q39.

Solution

Concept – identifying muscle types: Cell shape, nucleus number and striations tell the three muscle types apart.

Step 1 – match the description: Spindle-shaped cells with a single central nucleus and no striations are **smooth muscle**.

Step 2 – note its sites: Smooth muscle lines the gut, vessels and other viscera and contracts involuntarily.

Why the other options are wrong:

- A, Skeletal muscle: long, multinucleate and striated.
- C, Cardiac muscle: branched, striated, with central nuclei and intercalated discs.
- D, Striated myoepithelium: not a standard smooth-muscle description.

Final Answer: Smooth muscle $\Rightarrow$ B

Answer: (B) Go Back to Q39

Q40.

Solution

Concept – types of cartilage: Cartilage is classified by its fibre content.

Step 1 – match the sites: Intervertebral discs and knee menisci are **fibrocartilage**, dominated by bundles of type I collagen.

Step 2 – explain the property: This makes fibrocartilage strong in tension and able to resist compression and shear.

Why the other options are wrong:

- A, Hyaline cartilage: type II collagen; forms articular surfaces and the costal cartilages.
- C, Elastic cartilage: has elastic fibres; forms the ear and epiglottis.
- D, Calcified cartilage: a mineralised zone, not a discrete tissue type here.

Final Answer: Fibrocartilage $\Rightarrow$ B

Answer: (B) Go Back to Q40

Q41.

Solution

Concept – goblet cells: Scattered mucus-secreting cells stud the intestinal lining.

Step 1 – identify X: The wine-glass shape, narrow at the base and swollen with mucus at the top, marks a **goblet cell**.

Step 2 – state its role: It secretes mucus that lubricates and protects the intestinal surface.

Why the other options are wrong:

- A, Paneth cell: sits at the crypt base and secretes antimicrobial granules.
- B, Enteroendocrine cell: secretes hormones, not bulk mucus.
- C, Chief cell: a gastric cell that secretes pepsinogen.

Final Answer: Goblet cell $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q41

Q42.

Solution

Concept – the juxtaglomerular apparatus: This structure controls blood pressure through renin.

Step 1 – name the unit: The renin-secreting granular cells of the afferent arteriole plus the macula densa of the distal tubule form the **juxtaglomerular apparatus**.

Step 2 – state its function: It senses blood pressure and sodium delivery and releases renin to start the renin-angiotensin system.

Why the other options are wrong:

- B, Loop of Henle: concentrates urine but does not secrete renin.
- C, Bowman's capsule: the filtration cup around the glomerulus.
- D, Peritubular capillary bed: reabsorbs fluid but has no renin cells.

Final Answer: Juxtaglomerular apparatus $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q42

Q43.

Solution

Concept – cells of the seminiferous tubule: Two cell families support and produce sperm.

Step 1 – name the supporting cell: The **Sertoli cells** form the blood-testis barrier with their tight junctions and carry FSH receptors.

Step 2 – state their role: They nourish developing germ cells and secrete inhibin and androgen-binding protein.

Why the other options are wrong:

- A, Leydig cells: lie outside the tubule and make testosterone under LH.
- B, Spermatogonia: the germ cells themselves, not the support cells.
- D, Myoid cells: contractile cells around the tubule wall.

Final Answer: Sertoli cells $\Rightarrow$ C

Answer: (C) Go Back to Q43

Q44.

Solution

Concept – cri-du-chat syndrome: A cat-like cry is the hallmark of one deletion syndrome.

Step 1 – name the defect: Cri-du-chat is a deletion of the short arm (5p) of **chromosome 5**.

Step 2 – link to the features: Affected infants have a high-pitched cry, microcephaly, wide-set eyes and intellectual disability.

Why the other options are wrong:

- A, Chromosome 15: deletions here cause Prader-Willi or Angelman syndrome.
- B, Chromosome 21: trisomy here causes Down syndrome.
- C, Chromosome 4: 4p deletion causes Wolf-Hirschhorn syndrome, not the cat cry.

Final Answer: Chromosome 5 (5p deletion) $\Rightarrow$ D

Answer: (D) Go Back to Q44

Q45.

Solution

Concept – genomic imprinting on chromosome 15: The parent of origin of the 15q11-q13 deletion decides the syndrome.

Step 1 – match the paternal deletion: Loss of the **paternal** 15q11-q13 region gives **Prader-Willi syndrome**.

Step 2 – link to the picture: It causes neonatal hypotonia, then hyperphagia, obesity, short stature and hypogonadism.

Why the other options are wrong:

- A, Angelman syndrome: the maternal deletion of the same region.
- C, Cri-du-chat syndrome: a chromosome 5 deletion.
- D, Down syndrome: trisomy 21.

Final Answer: Prader-Willi syndrome $\Rightarrow$ B

Answer: (B) Go Back to Q45

Q46.

Solution

Concept – Fragile X syndrome: A trinucleotide repeat silences a key gene.

Step 1 – name the defect: Expansion of the CGG repeat in the **FMR1** gene on the X chromosome causes **Fragile X syndrome**.

Step 2 – link to the features: It gives intellectual disability, a long face, large ears and macro-orchidism, and is the commonest inherited cause of learning disability.

Why the other options are wrong:

- A, Klinefelter syndrome: a 47,XXY aneuploidy, not a repeat disorder.
- B, Huntington disease: a CAG repeat in the huntingtin gene, with chorea.
- D, Prader-Willi syndrome: a chromosome 15 deletion.

Final Answer: Fragile X syndrome $\Rightarrow$ C

Answer: (C) Go Back to Q46

Q47.

Solution

Concept – triple X (47,XXX): An extra X chromosome in a female is often mild.

Step 1 – state the phenotype: A 47,XXX individual is **a phenotypically normal female**, frequently tall, and usually fertile.

Step 2 – add the caveat: Some have mild learning or speech difficulties, but most are not clinically recognised.

Why the other options are wrong:

- B, Phenotypic male with small testes: describes Klinefelter (47,XXY).
- C, Short female with a webbed neck: describes Turner syndrome (45,X).
- D, Infertile male with gynaecomastia: again describes Klinefelter syndrome.

Final Answer: A phenotypically normal, usually fertile female $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q47

Q48.

Solution

Concept – Colles fracture: A fall on the outstretched hand loads the distal radius.

Step 1 – name the fracture: The "dinner-fork" deformity is a **Colles fracture of the distal radius**, with dorsal displacement of the distal fragment.

Step 2 – note the setting: It is typical of elderly, osteoporotic women after a fall onto the palm.

Why the other options are wrong:

- A, Scaphoid fracture: gives anatomical-snuffbox tenderness, not a dinner-fork wrist.
- C, Distal ulna alone: not the primary bone in this injury.
- D, Lunate: dislocation of the lunate is a different wrist injury.

Final Answer: Distal radius (Colles fracture) $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q48

Q49.

Solution

Concept – contents of the foramen magnum: This large opening in the occipital bone transmits several structures.

Step 1 – pick the correct one: The **spinal roots of the accessory nerve** ascend through the foramen magnum (along with the medulla and the vertebral arteries).

Step 2 – recall the full list: It also transmits the meninges, the anterior and posterior spinal arteries and the apical ligament of the dens.

Why the other options are wrong:

- A, Internal carotid artery: enters through the carotid canal.
- B, Glossopharyngeal nerve: exits through the jugular foramen.
- D, Hypoglossal nerve: exits through the hypoglossal canal, not the foramen magnum.

Final Answer: Spinal roots of the accessory nerve $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q49

Q50.

Solution

Concept – the cardiothoracic ratio: This simple ratio screens for an enlarged heart on a PA film.

Step 1 – state the threshold: Cardiomegaly is diagnosed when the ratio exceeds **0.5 (50%)**.

Step 2 – note the condition: The measurement is valid only on a proper PA film taken in full inspiration, as a poor AP or expiratory film falsely enlarges the heart.

Why the other options are wrong:

- A, 0.30: well within the normal range.
- B, 0.40: normal.
- C, 0.45: still normal; the accepted upper limit is 0.5.

Final Answer: 0.50 (50%) $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q50

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	A	3	D	4	A	5	B
6	D	7	A	8	B	9	D	10	C
11	B	12	C	13	B	14	A	15	C
16	C	17	A	18	A	19	B	20	A
21	A	22	D	23	C	24	D	25	A
26	D	27	D	28	C	29	D	30	B
31	A	32	B	33	C	34	C	35	A
36	B	37	C	38	D	39	B	40	B
41	D	42	A	43	C	44	D	45	B
46	C	47	A	48	B	49	C	50	D