INI CET Anatomy

Sample Paper – 5

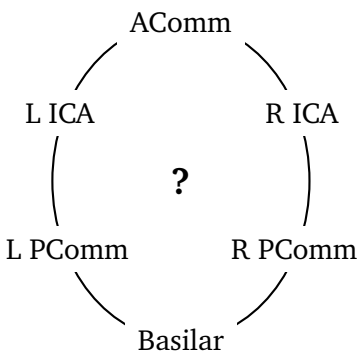
Duration: 45 Minutes **Maximum Marks: 50**

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 schematic below shows a ring of arteries at the base of the brain that unites the two internal carotid arteries with the basilar artery. This anastomotic ring is the:



(A) Circle of Willis

(B) Circle of Zinn

(C) Trolard venous circle

(D) Batson venous plexus

Q2. An aneurysm at which site of the arterial circle most characteristically compresses the optic chiasma and produces a bitemporal (hemianopic) visual-field defect, and is also the commonest site of a circle-of-Willis aneurysm?

(A) Posterior communicating artery

(B) Middle cerebral artery bifurcation

(C) Basilar artery tip

(D) Anterior communicating artery

Q3. A painful third-nerve (oculomotor) palsy with a fixed dilated pupil, ptosis and a “down-and-out” eye classically results from an aneurysm of the:

(A) Anterior cerebral artery

(B) Posterior communicating artery

(C) Superior cerebellar artery

(D) Middle meningeal artery

Q4. Occlusion of which artery produces contralateral weakness and sensory loss that is worst in the face and upper limb, while largely sparing the lower limb?

(A) Anterior cerebral artery

(B) Posterior cerebral artery

(C) Anterior choroidal artery

(D) Middle cerebral artery

Q5. Contralateral weakness and sensory loss confined mainly to the lower limb follows occlusion of the:

(A) Middle cerebral artery

(B) Posterior cerebral artery

(C) Anterior cerebral artery

(D) Posterior inferior cerebellar artery

Q6. Which of the following is a dural venous sinus that runs in the upper attached margin of the falx cerebri and drains posteriorly into the confluence of sinuses?

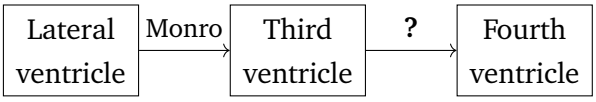
(A) Great cerebral vein of Galen

(B) Superior sagittal sinus

(C) Internal cerebral vein

(D) Basilar venous plexus

Q7. The flow chart traces cerebrospinal fluid from a lateral ventricle to the fourth ventricle. Which channel belongs in the box marked **?**, connecting the third and fourth ventricles?



(A) Interventricular foramen of Monro

(B) Median aperture of Magendie

(C) Cerebral aqueduct (of Sylvius)

(D) Lateral aperture of Luschka

Q8. Cerebrospinal fluid is produced mainly by which structure within the ventricles of the brain?

(A) Ependymal lining of the cerebral aqueduct

(B) Choroid plexus

(C) Arachnoid granulations

(D) Pia mater over the cortical surface

Q9. Thrombosis of which dural venous sinus threatens the nerves controlling eye movements (III, IV, VI), the ophthalmic and maxillary divisions of the trigeminal, and the internal carotid artery that runs through it?

(A) Sigmoid sinus

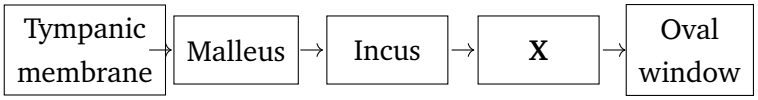
(B) Straight sinus

(C) Cavernous sinus

(D) Superior petrosal sinus

Head and Neck

Q10. The figure shows the chain of auditory ossicles running from the tympanic membrane to the oval window. Which ossicle occupies position **X**, its footplate fitting into the oval window (fenestra vestibuli)?



(A) Malleus

(B) Incus

(C) Stapes

(D) Cochlea

Q11. The stapedius muscle, which dampens ossicular vibration, is supplied by the facial nerve. Its paralysis, as in Bell's palsy, produces:

(A) Hyperacusis (intolerance of loud sounds)

(B) Conductive deafness with a dry ear

(C) Loss of taste over the posterior third of the tongue

(D) Vertigo with spontaneous nystagmus

Q12. The tensor tympani muscle, attached to the handle of the malleus, is supplied by a branch of which nerve?

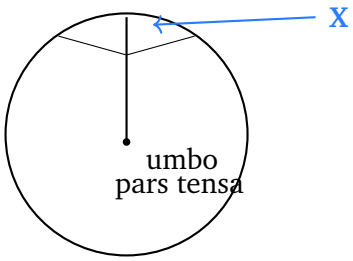
(A) Mandibular nerve (V_3)

(B) Facial nerve

(C) Glossopharyngeal nerve

(D) Vagus nerve

Q13. In the diagram of the right tympanic membrane, the small lax upper part marked **X**, lying above the malleolar folds and lacking the fibrous middle layer, is the:



right tympanic membrane

(A) Pars tensa

(B) Cone of light

(C) Umbo

(D) Pars flaccida (of Shrapnell)

Q14. Which structure connects the middle-ear cavity to the nasopharynx and equalises air pressure across the tympanic membrane?

(A) External acoustic meatus

(B) Aditus to the mastoid antrum

(C) Pharyngotympanic (Eustachian) tube

(D) Cochlear aqueduct

Q15. Within the facial canal the facial nerve carries a sensory ganglion at its bend (genu) and there gives off the greater petrosal nerve, before the chorda tympani leaves more distally. This ganglion is the:

(A) Geniculate ganglion

(B) Otic ganglion

(C) Trigeminal (semilunar) ganglion

(D) Spiral ganglion of the cochlea

Q16. The bony labyrinth of the internal ear consists of the cochlea, the vestibule and the:

(A) Semicircular canals

(B) Auditory ossicles

(C) Mastoid air cells

(D) Pharyngotympanic tube

Upper and Lower Limb

Q17. Injury to the superior gluteal nerve paralyses gluteus medius and minimus, giving a positive Trendelenburg sign. When the patient stands on the affected limb, the pelvis:

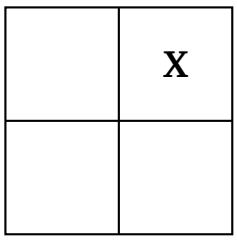
(A) Rises on the opposite side

(B) Tilts backward on both sides

(C) Drops on the same (weight-bearing) side

(D) Drops on the opposite (unsupported) side

Q18. The buttock is divided into four quadrants for an intramuscular injection. To avoid the sciatic nerve, the needle should enter the quadrant marked **X**. Which quadrant is the safe site?



right buttock (lateral / outer side to the right)

(A) Upper inner (supero-medial) quadrant

(B) Upper outer (supero-lateral) quadrant

(C) Lower inner (infero-medial) quadrant

(D) Lower outer (infero-lateral) quadrant

Q19. The inferior gluteal nerve is the sole motor supply to which muscle?

(A) Gluteus maximus

(B) Gluteus medius

(C) Piriformis

(D) Tensor fasciae latae

Q20. In the gluteal region the key muscular landmark used to identify the nerves and vessels as they emerge from the greater sciatic foramen is the:

(A) Gluteus maximus

(B) Obturator internus

(C) Quadratus femoris

(D) Piriformis

Q21. The pudendal nerve leaves the pelvis through the greater sciatic foramen, hooks around the ischial spine, and then re-enters the perineum by passing through the:

(A) Obturator foramen

(B) Greater sciatic foramen a second time

(C) Lesser sciatic foramen

(D) Inguinal canal

Q22. The hamstring muscles (except the short head of biceps femoris) are supplied by which division of the sciatic nerve?

(A) Common fibular (peroneal) division

(B) Tibial division

(C) Superior gluteal nerve

(D) Obturator nerve

Q23. The chief action of gluteus maximus, called upon most strongly when climbing stairs or rising from a seated position, is:

(A) Abduction of the hip

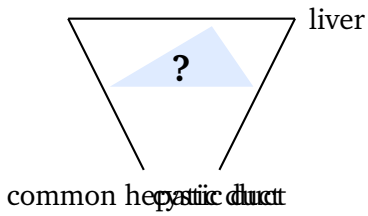
(B) Medial rotation of the hip

(C) Flexion of the hip

(D) Extension of the hip

Thorax, Abdomen and Pelvis

Q24. In the diagram, the shaded triangle marked **?** is bounded by the cystic duct, the common hepatic duct and the inferior surface of the liver, and is used to locate the cystic artery during cholecystectomy. It is the:



(A) Hesselbach's triangle

(B) Petit's lumbar triangle

(C) Pringle's triangle

(D) Calot's (cystohepatic) triangle

Q25. Within Calot's triangle, the cystic artery supplying the gallbladder most commonly arises from the:

(A) Left hepatic artery

(B) Right hepatic artery

(C) Gastroduodenal artery

(D) Superior mesenteric artery

Q26. In the free edge of the hepatoduodenal ligament, the common bile duct lies alongside two other major structures. These are the:

(A) Inferior vena cava and thoracic duct

(B) Proper hepatic artery and portal vein

(C) Splenic artery and splenic vein

(D) Left gastric artery and vein

Q27. The hepatopancreatic ampulla (of Vater), guarded by the sphincter of Oddi, opens on the major duodenal papilla in which part of the duodenum?

(A) Second (descending) part

(B) First (superior) part

(C) Third (horizontal) part

(D) Fourth (ascending) part

Q28. The main pancreatic duct, which runs the whole length of the gland and joins the bile duct at the ampulla of Vater, is the duct of:

(A) Santorini

(B) Bartholin

(C) Wirsung

(D) Rivinus

Q29. In the Couinaud segmental scheme of the liver, the caudate lobe is designated:

(A) Segment IV

(B) Segment VIII

(C) Segment I

(D) Segment V

Q30. The porta hepatis transmits, among other structures, the portal vein, the hepatic artery and the:

(A) Right and left hepatic ducts

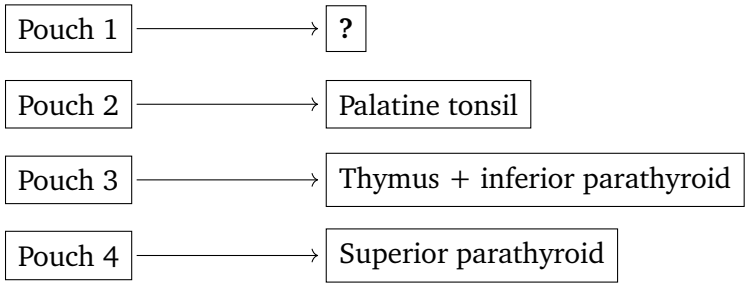
(B) Hepatic veins

(C) Inferior vena cava

(D) Ligamentum teres hepatis

Embryology

Q31. The flow chart matches each endodermal pharyngeal pouch to its main adult derivative. Which derivative belongs in the box marked **?** for the first pouch?



(A) Palatine tonsil

(B) Auditory tube and middle-ear cavity

(C) Thymus

(D) Superior parathyroid gland

Q32. The endoderm of the second pharyngeal pouch gives rise to the surface epithelium and crypts of the:

(A) Palatine tonsil

(B) Thymus

(C) Inferior parathyroid gland

(D) Thyroid gland

Q33. The third pharyngeal pouch gives rise to the thymus and to which gland, which then migrates caudally to lie on the lower pole of the thyroid?

(A) Superior parathyroid gland

(B) Inferior parathyroid gland

(C) Submandibular gland

(D) Ultimobranchial body

Q34. The superior parathyroid glands develop from the:

(A) Fourth pharyngeal pouch

(B) Third pharyngeal pouch

(C) Second pharyngeal pouch

(D) First pharyngeal pouch

Q35. A painless midline cystic swelling of the neck that moves upward on swallowing and on protrusion of the tongue, arising along the tract from the foramen cecum, is a:

(A) Branchial cyst

(B) Thyroglossal duct cyst

(C) Cystic hygroma

(D) Sublingual dermoid cyst

Q36. A fluctuant swelling in the lateral part of the neck at the anterior border of sternocleidomastoid, arising from the remnant of the second pharyngeal cleft, is a:

(A) Thyroglossal duct cyst

(B) Carotid body tumour

(C) Ranula

(D) Branchial (cleft) cyst

Q37. The thyroid gland first appears as a downgrowth from the floor of the pharynx and descends from a point on the tongue that is marked in the adult by the:

(A) Sulcus terminalis alone

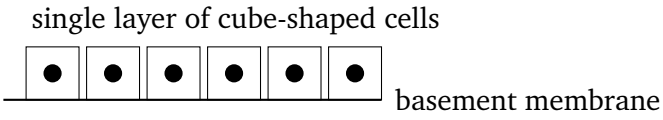
(B) Foramen cecum

(C) Palatoglossal fold

(D) Row of circumvallate papillae

Histology

Q38. The schematic shows a single layer of cube-shaped cells with round central nuclei resting on a basement membrane, the pattern seen lining kidney tubules and thyroid follicles. This epithelium is:



(A) Simple squamous epithelium

(B) Stratified cuboidal epithelium

(C) Simple columnar epithelium

(D) Simple cuboidal epithelium

Q39. A large multinucleated cell lying in a resorption bay (Howship's lacuna) on a bone surface, responsible for breaking down bone matrix, is the:

(A) Osteoclast

(B) Osteoblast

(C) Osteocyte

(D) Chondroblast

Q40. In the peripheral nervous system, the cell that wraps a single internodal segment of myelin around one axon is the:

(A) Oligodendrocyte

(B) Astrocyte

(C) Satellite cell

(D) Schwann cell

Q41. Coiled tubular glands lying in the submucosa and secreting alkaline mucus that protects the mucosa from acidic chyme are the histological hallmark of which part of the gut?

(A) Stomach

(B) Ileum

(C) Duodenum (Brunner's glands)

(D) Colon

Q42. The outermost zone of the adrenal cortex, the zona glomerulosa, secretes:

(A) Cortisol

(B) Aldosterone (a mineralocorticoid)

(C) Adrenaline

(D) Testosterone

Q43. The interstitial cells lying between the seminiferous tubules of the testis, which secrete testosterone under the drive of luteinising hormone, are the cells of:

(A) Sertoli

(B) Spermatogonia

(C) Leydig

(D) Peritubular myoid

Genetics and Cytogenetics

Q44. A tall patient with long thin limbs, arachnodactyly and upward dislocation of the lens (ectopia lentis) has an autosomal dominant defect in the gene coding for fibrillin-1 (FBN1). This is:

(A) Ehlers-Danlos syndrome

(B) Marfan syndrome

(C) Homocystinuria

(D) Osteogenesis imperfecta

Q45. An infant with progressive neurodegeneration and a cherry-red spot at the macula, caused by an autosomal recessive deficiency of hexosaminidase A, has:

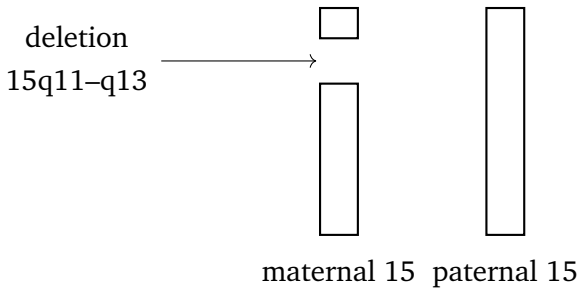
(A) Tay-Sachs disease

(B) Gaucher disease

(C) Niemann-Pick disease

(D) Hurler syndrome

Q46. The diagram shows a deletion of the 15q11–q13 region on the **maternally** inherited chromosome 15. A child with this deletion who has severe developmental delay, an ataxic "puppet-like" gait and frequent inappropriate laughter has:



(A) Prader-Willi syndrome

(B) Cri-du-chat syndrome

(C) Angelman syndrome

(D) DiGeorge syndrome

Q47. Failure of the two homologous chromosomes of a pair to separate during the first meiotic division (so that both pass into the same daughter cell) is termed:

(A) Anaphase lag

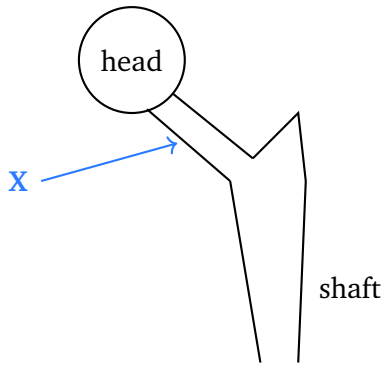
(B) Non-disjunction in meiosis II

(C) Balanced translocation

(D) Non-disjunction in meiosis I

Osteology and Radiological Anatomy

Q48. In the diagram of the proximal femur, an intracapsular fracture through the region marked **X** (the femoral neck) endangers the blood supply to the head and may cause avascular necrosis. The vessel chiefly responsible for supplying the femoral head is a branch of the:



(A) Obturator artery alone

(B) Lateral circumflex femoral artery

(C) Inferior gluteal artery

(D) Medial circumflex femoral artery

Q49. On a lateral skull radiograph, a saddle-shaped depression of the body of the sphenoid that houses the pituitary gland and balloons out when a pituitary adenoma enlarges is the:

(A) Sella turcica

(B) Foramen magnum

(C) Mastoid antrum

(D) Frontal sinus

Q50. On a chest radiograph, the appearance of air-filled bronchi standing out as dark branching lines against the surrounding white (consolidated) lung is called:

(A) Silhouette sign

(B) Kerley B lines

(C) Air bronchogram

(D) Meniscus sign

Detailed Solutions

Q1.

Solution

Concept – arterial supply of the brain: The internal carotid and vertebrobasilar systems are joined by an anastomotic ring at the base of the brain.

Step 1 – read the figure: The ring links the two internal carotids anteriorly through the anterior communicating artery and joins the basilar artery behind through the two posterior communicating arteries.

Step 2 – name it: This is the **circle of Willis**, the great arterial anastomosis that can maintain flow if one feeding vessel is blocked.

Why the other options are wrong:

- B, Circle of Zinn: a small arterial ring around the optic nerve head, not at the brain base.
- C, Trolard: refers to an anastomotic cortical vein, not an arterial ring.
- D, Batson plexus: the valveless vertebral venous plexus.

Final Answer: Circle of Willis $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q1

Q2.

Solution

Concept – aneurysms of the circle of Willis: The site of an aneurysm decides which nearby structure it compresses.

Step 1 – locate the chiasma: The optic chiasma lies just above and behind the anterior communicating artery.

Step 2 – link to the defect: An **anterior communicating artery** aneurysm, the commonest circle-of-Willis aneurysm, can press on the chiasma and cause a bitemporal field loss.

Why the other options are wrong:

- A, Posterior communicating: presses on the oculomotor nerve, giving a third-nerve palsy.
- B, Middle cerebral bifurcation: a common site, but not related to the chiasma.
- C, Basilar tip: presses on the brainstem and posterior structures.

Final Answer: Anterior communicating artery ⇒ D

Answer: (D) Go Back to Q2

Q3.

Solution

Concept – oculomotor nerve and its neighbours: The third nerve runs close to one artery of the circle.

Step 1 – name the artery: A **posterior communicating artery** aneurysm lies right beside the oculomotor nerve.

Step 2 – explain the signs: It compresses the superficial pupillary (parasympathetic) fibres, giving a dilated fixed pupil, ptosis and a down-and-out eye.

Why the other options are wrong:

- A, Anterior cerebral: related to the leg area of cortex, not the third nerve.
- C, Superior cerebellar: the third nerve runs between it and the posterior cerebral, but the classic aneurysm site is the PComm.
- D, Middle meningeal: an extradural artery, unrelated to the third nerve.

Final Answer: Posterior communicating artery ⇒ B

Answer: (B) Go Back to Q3

Q4.

Solution

Concept – cortical territories: Each cerebral artery supplies a defined strip of the motor and sensory cortex.

Step 1 – recall the homunculus: The face and upper limb lie on the lateral surface, supplied by the **middle cerebral artery**.

Step 2 – match the deficit: Its occlusion spares the leg (which is on the medial surface) and hits the face and arm hardest.

Why the other options are wrong:

- A, Anterior cerebral: supplies the leg area.
- B, Posterior cerebral: supplies the visual cortex.
- C, Anterior choroidal: a small deep branch, not a cortical face-arm territory.

Final Answer: Middle cerebral artery ⇒ D

Answer: (D) Go Back to Q4

Q5.

Solution

Concept – medial surface of the hemisphere: The lower limb area of the cortex sits on the medial surface, in the paracentral lobule.

Step 1 – name the artery: The **anterior cerebral artery** runs over the medial surface and supplies this leg area.

Step 2 – match the deficit: Its occlusion gives contralateral weakness and sensory loss mainly in the lower limb.

Why the other options are wrong:

- A, Middle cerebral: face and arm.
- B, Posterior cerebral: vision.
- D, PICA: lateral medullary (Wallenberg) signs, not a limb monoparesis.

Final Answer: Anterior cerebral artery $\Rightarrow$ C

Answer: (C) Go Back to Q5

Q6.

Solution

Concept – dural venous sinuses: These endothelial-lined channels run between the two layers of dura.

Step 1 – locate the sinus: The **superior sagittal sinus** runs in the upper (attached) margin of the falx cerebri along the midline.

Step 2 – trace its drainage: It flows backward to the confluence of sinuses at the internal occipital protuberance.

Why the other options are wrong:

- A, Great cerebral vein of Galen: a deep vein, not a dural sinus.
- C, Internal cerebral vein: a deep vein draining into the great cerebral vein.
- D, Basilar venous plexus: lies on the clivus, not in the falx.

Final Answer: Superior sagittal sinus $\Rightarrow$ B

Answer: (B) Go Back to Q6

Q7.

Solution

Concept – circulation of cerebrospinal fluid: CSF flows in sequence from the lateral ventricles to the fourth ventricle.

Step 1 – follow the chart: Lateral ventricle → third ventricle (via the foramen of Monro) → fourth ventricle.

Step 2 – fill the box: The third and fourth ventricles are joined by the **cerebral aqueduct (of Sylvius)**.

Why the other options are wrong:

- A, Foramen of Monro: joins the lateral and third ventricles (the first arrow).
- B, Foramen of Magendie: the median aperture from the fourth ventricle to the subarachnoid space.
- D, Foramen of Luschka: the lateral aperture of the fourth ventricle, again an exit, not the third-to-fourth link.

Final Answer: Cerebral aqueduct ⇒ C

Answer: (C) Go Back to Q7

Q8.

Solution

Concept – CSF production and absorption: Production and absorption occur at different sites.

Step 1 – name the producer: The **choroid plexus**, tufts of capillaries covered by ependyma in the ventricles, secretes most of the CSF.

Step 2 – contrast absorption: CSF is absorbed back into venous blood at the arachnoid granulations.

Why the other options are wrong:

- A, Ependymal lining of the aqueduct: lines the channel but does not produce CSF.
- C, Arachnoid granulations: absorb, not produce, CSF.
- D, Pia mater: a covering membrane, not a secretory structure.

Final Answer: Choroid plexus ⇒ B

Answer: (B) Go Back to Q8

Q9.

Solution

Concept – contents of the cavernous sinus: This sinus carries several nerves and one artery in its wall and lumen.

Step 1 – list its relations: The **cavernous sinus** holds cranial nerves III, IV, V_1, V_2 and VI, and the internal carotid artery.

Step 2 – explain the danger: Thrombosis (often from a spreading facial infection) can damage all of these, giving painful ophthalmoplegia.

Why the other options are wrong:

- A, Sigmoid sinus: drains to the internal jugular vein, no such cranial-nerve relations.
- B, Straight sinus: lies in the tentorium, draining deep cerebral veins.
- D, Superior petrosal sinus: a small connecting sinus along the petrous ridge.

Final Answer: Cavernous sinus $\Rightarrow$ C

Answer: (C) Go Back to Q9

Q10.

Solution

Concept – the ossicular chain: Three ossicles conduct vibration from the drum to the inner ear.

Step 1 – read the chain: Tympanic membrane $\rightarrow$ malleus $\rightarrow$ incus $\rightarrow$ **stapes** $\rightarrow$ oval window.

Step 2 – identify X: The ossicle whose footplate fits the oval window is the **stapes**, the smallest bone in the body.

Why the other options are wrong:

- A, Malleus: attached to the tympanic membrane, the first ossicle.
- B, Incus: the middle ossicle, between malleus and stapes.
- D, Cochlea: part of the inner ear, not an ossicle.

Final Answer: Stapes $\Rightarrow$ C

Answer: (C) Go Back to Q10

Q11.

Solution

Concept – action of stapedius: Stapedius steadies the stapes and dampens loud sounds.

Step 1 – effect of paralysis: When the facial nerve is damaged proximal to the nerve to stapedius, the muscle is paralysed and the stapes vibrates excessively.

Step 2 – name the symptom: The patient suffers **hyperacusis**, an uncomfortable sensitivity to ordinary sounds.

Why the other options are wrong:

- B, Conductive deafness: results from ossicular fixation or fluid, not stapedius palsy.
- C, Loss of posterior tongue taste: is a glossopharyngeal function.
- D, Vertigo with nystagmus: points to vestibular disease.

Final Answer: Hyperacusis $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q11

Q12.

Solution

Concept – nerve supply of the two tympanic muscles: The middle ear has two muscles with different nerves.

Step 1 – trace tensor tympani: It develops from the first arch, so it is supplied by the **mandibular nerve (V_3)**, through the nerve to medial pterygoid.

Step 2 – contrast stapedius: Stapedius is a second-arch muscle supplied by the facial nerve.

Why the other options are wrong:

- B, Facial nerve: supplies stapedius, not tensor tympani.
- C, Glossopharyngeal: gives sensation to the middle ear but no motor supply here.
- D, Vagus: supplies pharyngeal and laryngeal muscles, not tensor tympani.

Final Answer: Mandibular nerve (V_3) $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q12

Q13.

Solution

Concept – parts of the tympanic membrane: Most of the drum is taut, but a small upper part is lax.

Step 1 – read the figure: The label X points to the small triangular region above the anterior and posterior malleolar folds.

Step 2 – name it: This lax part, lacking the fibrous middle layer, is the **pars flaccida (of Shrapnell)**.

Why the other options are wrong:

- A, Pars tensa: the large taut part below the folds.
- B, Cone of light: a reflected-light triangle in the antero-inferior quadrant.
- C, Umbo: the central point at the tip of the malleus handle.

Final Answer: Pars flaccida $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q13

Q14.

Solution

Concept – ventilation of the middle ear: Middle-ear pressure is balanced through one tube.

Step 1 – name the tube: The **pharyngotympanic (Eustachian) tube** runs from the anterior wall of the middle ear to the nasopharynx.

Step 2 – state its role: Swallowing opens it, equalising air pressure on the two sides of the drum.

Why the other options are wrong:

- A, External acoustic meatus: the outer canal, on the other side of the drum.
- B, Aditus to the mastoid antrum: connects the middle ear to the mastoid air cells, not the nasopharynx.
- D, Cochlear aqueduct: links perilymph to the subarachnoid space.

Final Answer: Pharyngotympanic tube $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q14

Q15.

Solution

Concept – the facial nerve in its canal: The facial nerve bends sharply at the genu, where it carries a sensory ganglion.

Step 1 – name the ganglion: The **geniculate ganglion** sits at the genu and contains the cell bodies of taste and other sensory fibres.

Step 2 – link to its branches: The greater petrosal nerve leaves here; the chorda tympani leaves lower down.

Why the other options are wrong:

- B, Otic ganglion: a parasympathetic relay for the parotid, on the mandibular nerve.
- C, Trigeminal ganglion: the sensory ganglion of the fifth nerve, in the middle cranial fossa.
- D, Spiral ganglion: the cochlear sensory ganglion, part of the eighth nerve.

Final Answer: Geniculate ganglion $\Rightarrow$ A

Answer: (A) Go Back to Q15

Q16.

Solution

Concept – the bony labyrinth: The internal ear has three connected bony parts.

Step 1 – list them: The cochlea (for hearing), the vestibule (central chamber) and the **semicircular canals** (for balance).

Step 2 – complete the set: So the missing third component is the semicircular canals.

Why the other options are wrong:

- B, Auditory ossicles: lie in the middle ear, not the labyrinth.
- C, Mastoid air cells: are middle-ear-related spaces.
- D, Pharyngotympanic tube: connects the middle ear to the pharynx.

Final Answer: Semicircular canals $\Rightarrow$ A

Answer: (A) Go Back to Q16

Q17.

Solution

Concept – Trendelenburg sign: The hip abductors steady the pelvis when standing on one leg.

Step 1 – state the normal action: Gluteus medius and minimus (superior gluteal nerve) hold the pelvis level by pulling down on the weight-bearing side.

Step 2 – effect of paralysis: When these are weak and the patient stands on the affected leg, the pelvis **drops on the opposite (unsupported) side**.

Why the other options are wrong:

- A, Rises on the opposite side: the reverse of what happens.
- B, Tilts backward: not the abductor sign.
- C, Drops on the same side: describes the normal side bearing weight, not the palsy.

Final Answer: Drops on the opposite side $\Rightarrow$ D

Answer: (D) Go Back to Q17

Q18.

Solution

Concept – safe intramuscular injection in the buttock: The sciatic nerve runs through the lower and medial part of the gluteal region.

Step 1 – read the figure: The quadrant marked X is the **upper outer (superolateral)** one.

Step 2 – justify it: Injecting here keeps the needle well away from the sciatic nerve and the gluteal vessels.

Why the other options are wrong:

- A, Upper inner: risks the superior gluteal vessels and nerve.
- C, Lower inner: overlies the sciatic nerve and pudendal vessels.
- D, Lower outer: too close to the course of the sciatic nerve.

Final Answer: Upper outer quadrant $\Rightarrow$ B

Answer: (B) Go Back to Q18

Q19.

Solution

Concept – inferior gluteal nerve: It has a single muscular target.

Step 1 – name the muscle: The **gluteus maximus** is supplied only by the inferior gluteal nerve (L5, S1, S2).

Step 2 – confirm: No other muscle depends on this nerve.

Why the other options are wrong:

- B, Gluteus medius: supplied by the superior gluteal nerve.
- C, Piriformis: supplied by branches from S1 and S2 directly.
- D, Tensor fasciae latae: supplied by the superior gluteal nerve.

Final Answer: Gluteus maximus $\Rightarrow$ A

Answer: (A) Go Back to Q19

Q20.

Solution

Concept – the key of the gluteal region: One muscle is used to orient all the other structures.

Step 1 – name the landmark: Piriformis emerges through the greater sciatic foramen and divides it into a suprapiriform and an infrapiriform part.

Step 2 – use it: Nerves and vessels are named by whether they leave above or below piriformis, so it is the key landmark.

Why the other options are wrong:

- A, Gluteus maximus: a large cover, but not the reference for the foramen.
- B, Obturator internus: leaves through the lesser sciatic foramen.
- C, Quadratus femoris: a deep lateral rotator, not the orienting landmark.

Final Answer: Piriformis $\Rightarrow$ D

Answer: (D) Go Back to Q20

Q21.

Solution

Concept – course of the pudendal nerve: The nerve makes a short loop out of and back into the pelvis.

Step 1 – trace it: It leaves through the greater sciatic foramen, crosses the ischial spine, then re-enters through the **lesser sciatic foramen**.

Step 2 – reach the perineum: It then runs in the pudendal canal on the lateral wall of the ischio-anal fossa.

Why the other options are wrong:

- A, Obturator foramen: transmits the obturator nerve and vessels.
- B, Greater sciatic foramen again: it exits, but does not re-enter, through this.
- D, Inguinal canal: transmits the spermatic cord or round ligament, unrelated to the pudendal nerve.

Final Answer: Lesser sciatic foramen $\Rightarrow$ C

Answer: (C) Go Back to Q21

Q22.

Solution

Concept – divisions of the sciatic nerve: The sciatic nerve is really two nerves bound together.

Step 1 – match the hamstrings: The **tibial division** supplies semitendinosus, semimembranosus and the long head of biceps femoris.

Step 2 – note the exception: The short head of biceps femoris is supplied by the common fibular division.

Why the other options are wrong:

- A, Common fibular division: supplies only the short head of biceps among the hamstrings.
- C, Superior gluteal nerve: supplies the gluteal abductors.
- D, Obturator nerve: supplies the medial (adductor) compartment of the thigh.

Final Answer: Tibial division $\Rightarrow$ B

Answer: (B) Go Back to Q22

Q23.

Solution

Concept – action of gluteus maximus: It is the powerful extensor of the hip.

Step 1 – name the action: Gluteus maximus mainly produces **extension of the hip**, with some lateral rotation.

Step 2 – give the setting: It is recruited for powerful acts like climbing stairs and rising from a chair, not for ordinary level walking.

Why the other options are wrong:

- A, Abduction: is the job of gluteus medius and minimus.
- B, Medial rotation: is also done by the smaller glutei, not maximus.
- C, Flexion: is the opposite action, done by iliopsoas.

Final Answer: Extension of the hip $\Rightarrow$ D

Answer: (D) Go Back to Q23

Q24.

Solution

Concept – landmarks at cholecystectomy: A small triangle guides the surgeon to the cystic artery.

Step 1 – read the boundaries: The triangle bounded by the cystic duct, the common hepatic duct and the liver edge is **Calot's (cystohepatic) triangle**.

Step 2 – state its use: The cystic artery is found within it, so it must be dissected carefully.

Why the other options are wrong:

- A, Hesselbach's triangle: on the anterior abdominal wall, for direct hernias.
- B, Petit's triangle: in the lumbar region of the back.
- C, Pringle's manoeuvre: is a clamp on the hepatoduodenal ligament, not this triangle.

Final Answer: Calot's triangle $\Rightarrow$ D

Answer: (D) Go Back to Q24

Q25.

Solution

Concept – origin of the cystic artery: The gallbladder's artery usually comes from a nearby hepatic branch.

Step 1 – name the source: The cystic artery most often arises from the **right hepatic artery**, within Calot's triangle.

Step 2 – clinical note: Its variable origin is why the triangle must be defined before clipping.

Why the other options are wrong:

- A, Left hepatic artery: supplies the left liver, an uncommon variant source.
- C, Gastroduodenal artery: an occasional variant, not the usual source.
- D, Superior mesenteric artery: supplies the midgut, not the gallbladder.

Final Answer: Right hepatic artery $\Rightarrow$ B

Answer: (B) Go Back to Q25

Q26.

Solution

Concept – contents of the hepatoduodenal ligament: Its free edge carries the portal triad.

Step 1 – list the three: The common bile duct (anterior right), the **proper hepatic artery** (anterior left) and the **portal vein** (behind).

Step 2 – add the clinical note: This free edge forms the anterior margin of the epiploic foramen.

Why the other options are wrong:

- A, IVC and thoracic duct: the IVC lies behind the foramen, not in the ligament; the thoracic duct is in the thorax and posterior abdomen.
- C, Splenic vessels: run behind the stomach along the pancreas.
- D, Left gastric vessels: run in the lesser omentum near the stomach, not in this free edge.

Final Answer: Hepatic artery and portal vein $\Rightarrow$ B

Answer: (B) Go Back to Q26

Q27.

Solution

Concept – the ampulla of Vater: Bile and pancreatic ducts join and open at one papilla.

Step 1 – locate the papilla: The major duodenal papilla lies on the medial wall of the **second (descending) part** of the duodenum.

Step 2 – name the sphincter: The sphincter of Oddi surrounds the ampulla there.

Why the other options are wrong:

- B, First part: the duodenal cap, above the papilla.
- C, Third part: crossed by the superior mesenteric vessels, below the papilla.
- D, Fourth part: ascends to the duodenojejunal flexure, beyond the papilla.

Final Answer: Second (descending) part $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q27

Q28.

Solution

Concept – the pancreatic ducts: The gland has a main and an accessory duct.

Step 1 – name the main duct: The main pancreatic duct is the duct of **Wirsung**, running the length of the gland.

Step 2 – its ending: It joins the bile duct to form the ampulla at the major papilla.

Why the other options are wrong:

- A, Santorini: the accessory pancreatic duct, opening at the minor papilla.
- B, Bartholin: the greater vestibular gland of the vulva, unrelated.
- D, Rivinus: the minor sublingual ducts in the floor of the mouth.

Final Answer: Duct of Wirsung $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q28

Q29.

Solution

Concept – Couinaud segments of the liver: The liver is divided into eight functionally independent segments.

Step 1 – place the caudate lobe: The caudate lobe is **segment I**, lying behind the porta with its own vascular supply and drainage.

Step 2 – note its independence: Its separate drainage into the IVC explains why it is spared in some venous outflow disorders.

Why the other options are wrong:

- A, Segment IV: the quadrate lobe area, on the left medial section.
- B, Segment VIII: a superior right segment.
- D, Segment V: an inferior right segment.

Final Answer: Segment I $\Rightarrow$ C

Answer: (C) Go Back to Q29

Q30.

Solution

Concept – the porta hepatis: This is the "door" on the visceral surface of the liver.

Step 1 – list the main contents: It transmits the portal vein, the hepatic artery and the **right and left hepatic ducts**.

Step 2 – add the small structures: Nerves and lymphatics also pass through here.

Why the other options are wrong:

- B, Hepatic veins: leave the back of the liver to enter the IVC, not through the porta.
- C, Inferior vena cava: grooves the bare area posteriorly, not the porta.
- D, Ligamentum teres: enters at the inferior margin in the fissure, not the porta.

Final Answer: Right and left hepatic ducts $\Rightarrow$ A

Answer: (A) Go Back to Q30

Q31.

Solution

Concept – derivatives of the pharyngeal pouches: Each endodermal pouch forms a defined adult structure.

Step 1 – read the chart: Pouches 2, 3 and 4 are already filled; the first pouch is left blank.

Step 2 – fill the box: The first pharyngeal pouch forms the **auditory (pharyngo-tympanic) tube and the middle-ear cavity** (tubotympanic recess).

Why the other options are wrong:

- A, Palatine tonsil: the second-pouch derivative.
- C, Thymus: a third-pouch derivative.
- D, Superior parathyroid: a fourth-pouch derivative.

Final Answer: Auditory tube and middle ear $\Rightarrow$ $\boxed{B}$

Answer: (B) Go Back to Q31

Q32.

Solution

Concept – the second pharyngeal pouch: It contributes lymphoid tissue to the pharynx.

Step 1 – name the derivative: The endoderm of the second pouch forms the epithelium and crypts of the **palatine tonsil**.

Step 2 – add the detail: Lymphoid tissue then invades the mesenchyme around these crypts.

Why the other options are wrong:

- B, Thymus: a third-pouch derivative.
- C, Inferior parathyroid: a third-pouch derivative.
- D, Thyroid: arises from the floor of the pharynx (foramen cecum), not a pouch.

Final Answer: Palatine tonsil $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q32

Q33.

Solution

Concept – the third pharyngeal pouch: Its dorsal and ventral parts form two different structures.

Step 1 – name the two: The ventral part forms the thymus; the dorsal part forms the **inferior parathyroid gland**.

Step 2 – explain the position: Because the thymus drags it down, the third-pouch parathyroid ends up lower than the fourth-pouch one.

Why the other options are wrong:

- A, Superior parathyroid: comes from the fourth pouch.
- C, Submandibular gland: develops from an oral ectodermal/endodermal bud, not a pouch.
- D, Ultimobranchial body: arises from the fourth (fifth) pouch and gives the C cells.

Final Answer: Inferior parathyroid gland $\Rightarrow$ B

Answer: (B) Go Back to Q33

Q34.

Solution

Concept – origin of the superior parathyroids: They come from a more caudal pouch than expected.

Step 1 – name the pouch: The superior parathyroid glands develop from the **fourth pharyngeal pouch**.

Step 2 – explain the paradox: Although from the fourth pouch, they migrate little and end up higher than the third-pouch (inferior) glands.

Why the other options are wrong:

- B, Third pouch: gives the inferior parathyroids and thymus.
- C, Second pouch: gives the palatine tonsil.
- D, First pouch: gives the middle ear and auditory tube.

Final Answer: Fourth pharyngeal pouch $\Rightarrow$ A

Answer: (A) Go Back to Q34

Q35.

Solution

Concept – the thyroglossal tract: The thyroid descends from the tongue, and remnants of its tract can form a cyst.

Step 1 – recognise the swelling: A midline neck cyst that moves up on swallowing and on tongue protrusion is a **thyroglossal duct cyst**.

Step 2 – explain the movement: The tract is attached to the hyoid and the base of the tongue, so protruding the tongue tugs the cyst upward.

Why the other options are wrong:

- A, Branchial cyst: lies laterally, not in the midline, and does not move with the tongue.
- C, Cystic hygroma: a soft lymphatic swelling, usually in the posterior triangle.
- D, Sublingual dermoid: sits in the floor of the mouth, not moving with swallowing.

Final Answer: Thyroglossal duct cyst $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q35

Q36.

Solution

Concept – branchial cleft remnants: An unclosed cervical sinus can persist as a lateral cyst.

Step 1 – recognise the swelling: A lateral neck cyst at the anterior border of sternocleidomastoid, from the second cleft, is a **branchial (cleft) cyst**.

Step 2 – add the detail: It is lined by squamous epithelium and often presents in young adults.

Why the other options are wrong:

- A, Thyroglossal cyst: is midline and moves with the tongue.
- B, Carotid body tumour: a solid, pulsatile mass at the bifurcation, not a cyst.
- C, Ranula: a retention cyst in the floor of the mouth.

Final Answer: Branchial (cleft) cyst $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q36

Q37.

Solution

Concept – descent of the thyroid gland: The thyroid begins on the tongue and descends in the neck.

Step 1 – name the starting point: It begins as a downgrowth at the **foramen cecum**, at the junction of the anterior two-thirds and posterior third of the tongue.

Step 2 – trace the descent: It then descends along the thyroglossal duct to its final position in front of the trachea.

Why the other options are wrong:

- A, Sulcus terminalis alone: marks the V, but the pit at its apex is the foramen cecum, the true origin.
- C, Palatoglossal fold: an arch at the side of the oral cavity, unrelated.
- D, Circumvallate papillae: lie in front of the sulcus terminalis, not the origin of descent.

Final Answer: Foramen cecum $\Rightarrow$ B

Answer: (B) Go Back to Q37

Q38.

Solution

Concept – classifying epithelia: Cell shape and number of layers define the epithelium.

Step 1 – read the figure: A single row of cube-shaped cells with central round nuclei sits on the basement membrane.

Step 2 – name it: This is **simple cuboidal epithelium**, seen in kidney tubules and lining thyroid follicles.

Why the other options are wrong:

- A, Simple squamous: flat, plate-like cells, not cubes.
- B, Stratified cuboidal: has several layers, but the figure shows one.
- C, Simple columnar: tall cells with basal nuclei, not cubes.

Final Answer: Simple cuboidal epithelium $\Rightarrow$ D

Answer: (D) Go Back to Q38

Q39.

Solution

Concept – bone cells: Different cells build and break down bone.

Step 1 – match the description: A large multinucleated cell in a Howship's lacuna, resorbing bone, is the **osteoclast**.

Step 2 – note its origin: It is derived from the monocyte-macrophage line, not from osteoprogenitor cells.

Why the other options are wrong:

- B, Osteoblast: a mononuclear cell that lays down new matrix.
- C, Osteocyte: a mature cell trapped in a lacuna within the matrix.
- D, Chondroblast: forms cartilage, not bone.

Final Answer: Osteoclast $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q39

Q40.

Solution

Concept – myelination in the PNS: Peripheral and central myelin are made by different cells.

Step 1 – name the cell: In the peripheral nervous system the **Schwann cell** forms myelin.

Step 2 – state the ratio: Each Schwann cell myelinates a single internode of one axon.

Why the other options are wrong:

- A, Oligodendrocyte: makes myelin in the central nervous system and covers several axons.
- B, Astrocyte: a supporting glial cell, not a myelin former.
- C, Satellite cell: surrounds neuron cell bodies in ganglia, not axons.

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

Answer: (D) Go Back to Q40

Q41.

Solution

Concept – glands of the gut wall: Submucosal glands are a distinctive feature of one region.

Step 1 – identify the glands: Coiled submucosal glands secreting alkaline mucus are the **Brunner's glands of the duodenum**.

Step 2 – state their role: Their alkaline secretion neutralises the acidic chyme arriving from the stomach.

Why the other options are wrong:

- A, Stomach: has mucosal gastric glands, not submucosal ones.
- B, Ileum: is marked by Peyer's patches, not submucosal mucous glands.
- D, Colon: has straight mucosal crypts rich in goblet cells, again not submucosal glands.

Final Answer: Duodenum (Brunner's glands) $\Rightarrow$ C

Answer: (C) Go Back to Q41

Q42.

Solution

Concept – zones of the adrenal cortex: Each cortical zone makes a different steroid.

Step 1 – name the outer zone product: The zona glomerulosa secretes **aldosterone**, the main mineralocorticoid.

Step 2 – recall the mnemonic: "Salt, sugar, sex" from outside in: glomerulosa (salt), fasciculata (sugar), reticularis (sex steroids).

Why the other options are wrong:

- A, Cortisol: comes from the zona fasciculata.
- C, Adrenaline: comes from the adrenal medulla, not the cortex.
- D, Testosterone (androgens): comes mainly from the zona reticularis.

Final Answer: Aldosterone $\Rightarrow$ B

Answer: (B) Go Back to Q42

Q43.

Solution

Concept – endocrine cells of the testis: Testosterone comes from a specific interstitial cell.

Step 1 – name the cell: The **Leydig (interstitial) cells**, between the seminiferous tubules, secrete testosterone.

Step 2 – state the control: Luteinising hormone from the pituitary drives their secretion.

Why the other options are wrong:

- A, Sertoli cells: support spermatogenesis and make inhibin, not testosterone.
- B, Spermatogonia: are the germ cells that become sperm.
- D, Peritubular myoid cells: contract to move sperm along, not endocrine.

Final Answer: Leydig cells $\Rightarrow$ C

Answer: (C) Go Back to Q43

Q44.

Solution

Concept – fibrillin and connective tissue: A fibrillin defect weakens elastic connective tissue.

Step 1 – match the picture: Tall stature, arachnodactyly and upward lens dislocation with an FBN1 defect point to **Marfan syndrome**.

Step 2 – add the risk: These patients are prone to aortic root dilatation and dissection.

Why the other options are wrong:

- A, Ehlers-Danlos: hyperextensible skin and joints, from collagen defects.
- C, Homocystinuria: resembles Marfan but the lens dislocates downward and it is autosomal recessive.
- D, Osteogenesis imperfecta: brittle bones and blue sclerae, from type I collagen defects.

Final Answer: Marfan syndrome $\Rightarrow$ B

Answer: (B) Go Back to Q44

Q45.

Solution

Concept – lysosomal storage disease: An enzyme deficiency lets a substrate build up in neurons.

Step 1 – match the enzyme: Deficiency of hexosaminidase A, with a cherry-red macula and neurodegeneration, is **Tay-Sachs disease**.

Step 2 – note the accumulation: GM2 ganglioside accumulates in neurons, causing the decline.

Why the other options are wrong:

- B, Gaucher disease: glucocerebrosidase deficiency, with hepatosplenomegaly.
- C, Niemann-Pick: sphingomyelinase deficiency; a cherry-red spot can occur but the enzyme differs.
- D, Hurler syndrome: a mucopolysaccharidosis with coarse features and organomegaly.

Final Answer: Tay-Sachs disease $\Rightarrow$ A

Answer: (A) Go Back to Q45

Q46.

Solution

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

Step 1 – read the figure: The deletion is on the **maternal** chromosome 15.

Step 2 – name the syndrome: A maternal 15q11–q13 deletion causes **Angelman syndrome**, with ataxia, laughter and severe delay (the "happy puppet").

Why the other options are wrong:

- A, Prader-Willi: the same region deleted, but on the **paternal** chromosome.
- B, Cri-du-chat: a deletion on chromosome 5p, with a cat-like cry.
- D, DiGeorge: a 22q11 deletion, with thymic and parathyroid defects.

Final Answer: Angelman syndrome $\Rightarrow$ C

Answer: (C) Go Back to Q46

Q47.

Solution

Concept – non-disjunction: Chromosomes can fail to separate at either meiotic division.

Step 1 – define the first-division error: Failure of **homologous chromosomes** to separate is non-disjunction in **meiosis I**.

Step 2 – contrast meiosis II: Failure of sister chromatids to separate is non-disjunction in meiosis II.

Why the other options are wrong:

- A, Anaphase lag: loss of a chromosome that fails to reach a pole, a different mechanism.
- B, Non-disjunction in meiosis II: involves sister chromatids, not homologues.
- C, Balanced translocation: exchange of material between chromosomes, not a separation failure.

Final Answer: Non-disjunction in meiosis I $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q47

Q48.

Solution

Concept – blood supply of the femoral head: The retinacular vessels running up the neck are the key supply.

Step 1 – read the figure: An intracapsular fracture through the neck (X) tears the retinacular vessels.

Step 2 – name the source: These vessels come mainly from the **medial circumflex femoral artery**, so the head may undergo avascular necrosis.

Why the other options are wrong:

- A, Obturator artery alone: supplies only a small area through the ligament of the head, insufficient in adults.
- B, Lateral circumflex femoral artery: supplies mainly the anterior neck and trochanter, a minor contribution.
- C, Inferior gluteal artery: supplies gluteal muscles, not the femoral head.

Final Answer: Medial circumflex femoral artery $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q48

Q49.

Solution

Concept – the pituitary fossa on a skull film: The pituitary sits in a saddle-shaped hollow of the sphenoid.

Step 1 – name the fossa: The **sella turcica** houses the pituitary gland.

Step 2 – link to disease: A pituitary adenoma enlarges and balloons the sella, seen on a lateral skull radiograph.

Why the other options are wrong:

- B, Foramen magnum: the large hole for the spinal cord, in the occipital bone.
- C, Mastoid antrum: an air space in the temporal bone.
- D, Frontal sinus: an air sinus in the frontal bone.

Final Answer: Sella turcica $\Rightarrow$ A

Answer: (A) Go Back to Q49

Q50.

Solution

Concept – signs of lung consolidation: Air in bronchi becomes visible when the surrounding lung fills with fluid.

Step 1 – describe the sign: Dark branching bronchi against white consolidated lung form an **air bronchogram**.

Step 2 – give the setting: It is typical of lobar pneumonia and other alveolar-filling processes.

Why the other options are wrong:

- A, Silhouette sign: loss of a normal border where two soft-tissue densities meet.
- B, Kerley B lines: short horizontal lines of interstitial oedema at the lung periphery.
- D, Meniscus sign: the curved upper level of a pleural effusion.

Final Answer: Air bronchogram $\Rightarrow$ C

Answer: (C) Go Back to Q50

Answer Key

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