INI CET Anatomy

Sample Paper – 6

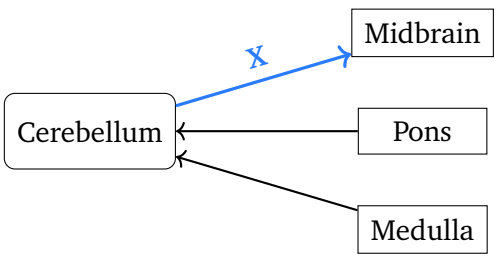
Duration: 45 Minutes **Maximum Marks: 50**

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. In the schematic below, the cerebellar peduncle marked **X** connects the cerebellum to the midbrain and carries efferent fibres from the dentate nucleus to the contralateral red nucleus and thalamus. This peduncle is the:



(A) Inferior cerebellar peduncle

(B) Superior cerebellar peduncle

(C) Middle cerebellar peduncle

(D) Juxtarestiform body

Q2. The middle cerebellar peduncle, the largest of the three, is composed almost entirely of which fibres?

(A) Olivocerebellar climbing fibres

(B) Pontocerebellar (transverse pontine) afferent fibres

(C) Dentatorubral efferent fibres

(D) Dorsal spinocerebellar fibres

Q3. The largest of the deep cerebellar nuclei, whose damage produces dysmetria and an intention tremor of the ipsilateral limb, is the:

(A) Fastigial nucleus

(B) Emboliform nucleus

(C) Dentate nucleus

(D) Globose nucleus

Q4. Which part of the cerebellum, connected to the vestibular nuclei, is chiefly responsible for the control of balance and equilibrium?

(A) Anterior lobe

(B) Flocculonodular lobe (vestibulocerebellum)

(C) Posterior (neocerebellar) lobe

(D) Dentate nucleus

Q5. A midline tumour of the cerebellar vermis in a child most characteristically presents with:

(A) Truncal ataxia with a broad-based, staggering gait

(B) A resting tremor of one hand

(C) Isolated loss of pain sensation in the legs

(D) A spastic hemiplegia

Q6. Because of the "double-crossing" of cerebellar pathways, a destructive lesion of the right cerebellar hemisphere produces incoordination on which side of the body?

(A) The left side (contralateral to the lesion)

(B) Both sides equally

(C) Neither side; only sensory loss occurs

(D) The right side (ipsilateral, same side as the lesion)

Q7. The vestibular nuclei, lying in the floor of the fourth ventricle, receive primary afferent fibres from which cranial nerve?

(A) Trigeminal nerve (V)

(B) Facial nerve (VII)

(C) Vestibulocochlear nerve (VIII)

(D) Glossopharyngeal nerve (IX)

Q8. The rhomboid fossa, which forms the floor of the fourth ventricle, is made up of the posterior surface of the:

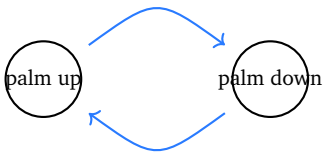
(A) Pons and the upper (open) part of the medulla oblongata

(B) Cerebellum only

(C) Tectum of the midbrain

(D) Thalamus

Q9. The clinical sign demonstrated in the figure, an inability to perform rapid alternating movements such as quickly pronating and supinating the hand, is called:



rapid pronation–supination

(A) Dysmetria

(B) Intention tremor

(C) Dysarthria

(D) Dysdiadochokinesia

Head and Neck

Q10. Which muscles form the main muscular wall of the pharynx and contract in sequence during swallowing to propel the bolus downward?

(A) Stylopharyngeus, salpingopharyngeus and palatopharyngeus

(B) The paired cricothyroid muscles

(C) Superior, middle and inferior pharyngeal constrictors

(D) Buccinator and orbicularis oris

Q11. A pharyngeal (Zenker's) pouch herniates through Killian's dehiscence, a triangular weak area between the thyropharyngeus and cricopharyngeus parts of the:

(A) Inferior pharyngeal constrictor

(B) Superior pharyngeal constrictor

(C) Middle pharyngeal constrictor

(D) Stylopharyngeus

Q12. Waldeyer's lymphatic ring, which guards the entrance to the respiratory and digestive tracts, is formed mainly by the:

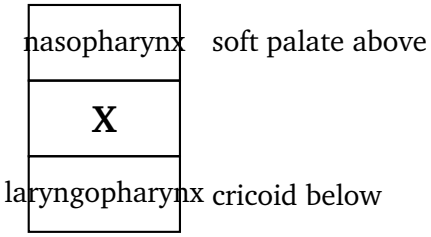
(A) Deep cervical chain of lymph nodes

(B) Palatine, pharyngeal, tubal and lingual tonsils

(C) Submandibular salivary glands

(D) Thyroid and parathyroid tissue

Q13. In the diagram of the pharynx divided into its three parts, the middle segment marked **X**, lying behind the oral cavity between the soft palate and the upper border of the epiglottis, is the:



(A) Nasopharynx

(B) Oropharynx

(C) Laryngopharynx (hypopharynx)

(D) Cervical oesophagus

Q14. A swallowed fish bone frequently lodges in the piriform fossa, where it may injure which nerve lying just deep to the mucosa?

(A) Recurrent laryngeal nerve

(B) External laryngeal nerve

(C) Internal laryngeal nerve

(D) Glossopharyngeal nerve

Q15. Which is the only muscle of the pharynx that is supplied by the glossopharyngeal nerve (IX) rather than by the pharyngeal plexus?

(A) Superior constrictor

(B) Salpingopharyngeus

(C) Palatopharyngeus

(D) Stylopharyngeus

Q16. Motor supply to all the muscles of the pharynx (except stylopharyngeus) is carried through the pharyngeal plexus by fibres derived from the:

(A) Glossopharyngeal nerve

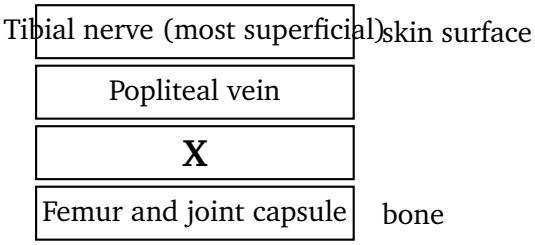
(B) Vagus nerve

(C) Facial nerve

(D) Hypoglossal nerve

Upper and Lower Limb

Q17. The layered diagram shows the contents of the popliteal fossa from the skin surface down to the bone. Which structure, marked **X**, lies deepest in the fossa (closest to the femur)?



(A) Tibial nerve

(B) Popliteal artery

(C) Popliteal vein

(D) Common fibular nerve

Q18. Which nerve forms the lateral boundary of the popliteal fossa, running downward along the medial border of the tendon of biceps femoris?

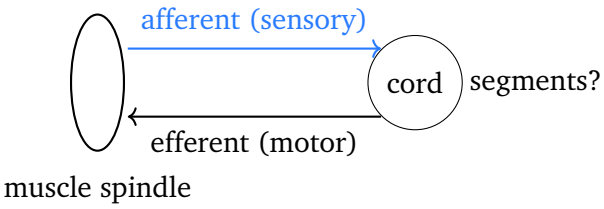
(A) Tibial nerve

(B) Saphenous nerve

(C) Sural nerve

(D) Common fibular (common peroneal) nerve

Q19. The knee-jerk (patellar tendon) reflex, whose arc is shown below, is mediated chiefly through which spinal cord segments?



(A) L3 and L4

(B) L5 and S1

(C) S1 and S2

(D) L1 and L2

Q20. Extension of the leg at the knee is produced chiefly by the quadriceps femoris, a muscle group supplied by the:

(A) Sciatic nerve

(B) Obturator nerve

(C) Tibial nerve

(D) Femoral nerve

Q21. The rich arterial network around the knee, which keeps the leg supplied with blood when the popliteal artery is compressed in full flexion, is formed largely by the:

(A) Branches of the femoral artery alone

(B) Branches of the obturator artery

(C) Genicular branches of the popliteal artery

(D) Perforating branches of the profunda femoris

Q22. Which two muscles form the medial hamstrings and make up the superomedial boundary of the popliteal fossa?

(A) Semimembranosus and semitendinosus

(B) Biceps femoris and popliteus

(C) Gracilis and sartorius

(D) The two heads of gastrocnemius

Q23. A pulsatile, expansile swelling felt in the popliteal fossa is most suggestive of an aneurysm of the:

(A) Popliteal vein

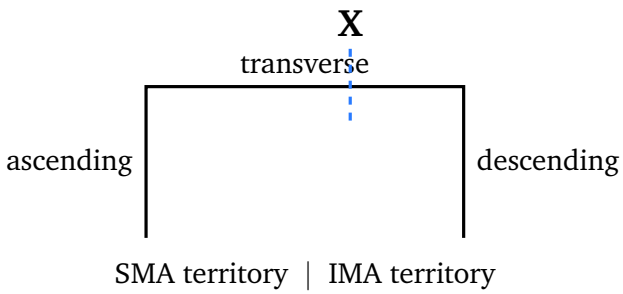
(B) Small saphenous vein

(C) Femoral artery

(D) Popliteal artery

Thorax, Abdomen and Pelvis

Q24. In the diagram of the colon, the dashed line marked **X** separates the territory of the superior mesenteric artery from that of the inferior mesenteric artery. The superior mesenteric artery (midgut) supplies the gut as far distally as:



(A) The splenic flexure and left colon

(B) The duodenojejunal flexure only

(C) The upper part of the rectum

(D) The junction of the proximal two-thirds and distal one-third of the transverse colon

Q25. The inferior mesenteric artery supplies the hindgut, extending from the distal transverse colon down to the:

(A) Upper part of the rectum

(B) Anal canal below the pectinate line

(C) Second part of the duodenum

(D) Caecum and appendix

Q26. The continuous anastomotic arterial channel that runs along the mesenteric border of the entire colon, linking the branches of the superior and inferior mesenteric arteries, is the:

(A) Arc of Riolan

(B) Ileocolic artery

(C) Marginal artery of Drummond

(D) Middle colic artery

Q27. Ischaemic colitis most commonly strikes the region of the splenic flexure because it is a watershed zone between two arterial territories, a point known as:

(A) Sudeck's point

(B) Cannon–Böhm point

(C) Griffith's point

(D) McBurney's point

Q28. The appendicular artery, which runs in the free edge of the mesoappendix to supply the vermiform appendix, is a branch of the:

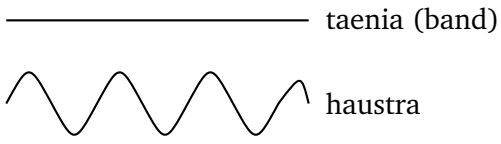
(A) Ileocolic artery

(B) Right colic artery

(C) Superior mesenteric artery directly

(D) Middle colic artery

Q29. The figure shows a segment of large intestine. The three thickened longitudinal bands of smooth muscle that gather the wall into pouches (haustra) are the:



(A) Plicae circulares

(B) Taeniae coli

(C) Appendices epiploicae

(D) Gastric rugae

Q30. The sigmoid colon is especially prone to volvulus (twisting on its own axis) because it possesses a:

(A) Fixed retroperitoneal position

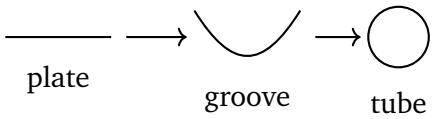
(B) Very short, broad-based mesentery

(C) Complete absence of taeniae coli

(D) Long, mobile mesocolon attached by a narrow root

Embryology

Q31. The figure traces the folding of the ectoderm shown below. The process by which the flat neural plate folds and fuses in the midline to form the neural tube is called:



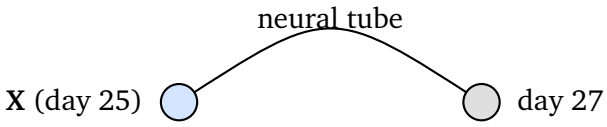
(A) Neurulation

(B) Gastrulation

(C) Segmentation

(D) Canalisation

Q32. In the diagram of the closing neural tube, the opening marked **X** (the anterior/rostral neuropore) normally seals at about day 25. Failure of this opening to close results in:



(A) Spina bifida

(B) Anencephaly

(C) Meckel's diverticulum

(D) Omphalocele

Q33. The posterior (caudal) neuropore normally closes at about day 27. Failure of its closure most typically produces:

(A) Anencephaly

(B) Holoprosencephaly

(C) Microcephaly

(D) Spina bifida (myelomeningocele)

Q34. Which of the following structures is a derivative of neural crest cells?

(A) Anterior horn motor neurons

(B) Skeletal muscle of the limbs

(C) Dorsal root ganglion neurons, melanocytes and the adrenal medulla

(D) The notochord

Q35. Peri-conceptional supplementation with which vitamin markedly lowers the risk of neural tube defects in the fetus?

(A) Vitamin A (retinol)

(B) Folic acid (folate)

(C) Vitamin D (cholecalciferol)

(D) Vitamin K (phylloquinone)

Q36. In which form of spina bifida do both the meninges and neural (spinal cord) tissue herniate through the vertebral defect?

(A) Spina bifida occulta

(B) Meningocele (meninges only)

(C) Cranium bifidum

(D) Meningomyelocele (meninges and neural tissue)

Q37. In the developing spinal cord, the alar plate gives rise to which functional group of neurons?

(A) Somatic motor (efferent) neurons

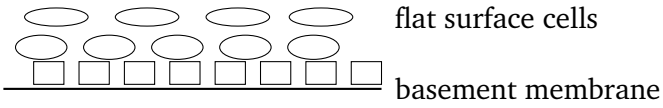
(B) Sensory (afferent) association neurons

(C) Preganglionic sympathetic neurons only

(D) Notochordal cells

Histology

Q38. The schematic shows a lining epithelium of many cell layers whose flattened surface cells lack a keratin layer. This epithelium, typical of the oesophagus, is:



(A) Stratified squamous non-keratinised epithelium

(B) Simple columnar epithelium

(C) Transitional epithelium (urothelium)

(D) Pseudostratified ciliated columnar epithelium

Q39. The mature bone cell that sits within a lacuna and communicates with its neighbours through fine canaliculi, acting as a mechanosensor of the bone matrix, is the:

(A) Osteoblast

(B) Osteoclast

(C) Osteocyte

(D) Osteoprogenitor cell

Q40. Which neuroglial cell forms the myelin sheath around several axons at once within the central nervous system?

(A) Oligodendrocyte

(B) Schwann cell

(C) Astrocyte

(D) Microglial cell

Q41. The cells found at the base of the intestinal crypts (of Lieberkühn) that secrete lysozyme and defensins as part of innate defence are the:

(A) Goblet cells

(B) Enteroendocrine cells

(C) Paneth cells

(D) Parietal (oxyntic) cells

Q42. The acidophil cells of the anterior pituitary (pars distalis) chiefly secrete:

(A) ACTH and TSH

(B) FSH and LH

(C) ADH and oxytocin

(D) Growth hormone and prolactin

Q43. The corpus luteum that forms in the ovary after ovulation secretes mainly which hormone from its granulosa lutein cells?

(A) Progesterone

(B) Testosterone

(C) Thyroxine

(D) Aldosterone

Genetics and Cytogenetics

Q44. The commonest form of short-limbed (disproportionate) dwarfism, caused by a gain-of-function mutation in the FGFR3 gene and inherited in an autosomal dominant manner, is:

(A) Achondroplasia

(B) Marfan syndrome

(C) Osteogenesis imperfecta

(D) Turner syndrome

Q45. Sickle cell anaemia results from a single point mutation causing a glutamate-to-valine substitution in which globin chain?

(A) The alpha-globin chain

(B) The gamma-globin chain

(C) The delta-globin chain

(D) The beta-globin chain

Q46. A boy who rises from the floor by "climbing up his own legs" (Gower's sign) and shows pseudohypertrophy of the calves has a defect in the gene coding for which protein?

(A) Fibrillin

(B) Dystrophin

(C) Type I collagen

(D) Spectrin

Q47. DiGeorge syndrome, in which failure of the third and fourth pharyngeal pouches leads to thymic and parathyroid aplasia, is caused by a microdeletion at:

(A) 22q11.2

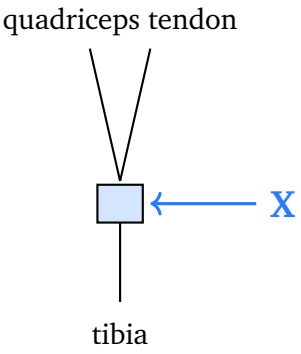
(B) 15q11–q13

(C) 5p15

(D) 7q11.23

Osteology and Radiological Anatomy

Q48. In the diagram of the front of the knee, the bone marked **X**, embedded within the tendon of the quadriceps femoris, is the largest sesamoid bone of the body. It is the:



(A) Pisiform

(B) Fabella

(C) Patella

(D) Hamate

Q49. Which bone is the first in the body to begin ossifying and does so largely by intramembranous (membranous) ossification?

(A) Femur

(B) Mandible

(C) Clavicle

(D) Frontal bone

Q50. On a chest radiograph, loss (silhouetting) of the normally sharp right heart border indicates consolidation of which lobe of the lung?

(A) Right lower lobe

(B) Right middle lobe

(C) Left lower lobe

(D) Lingula of the left lung

Detailed Solutions

Q1.

Solution

Concept – the three cerebellar peduncles: Each peduncle links the cerebellum to a different part of the brainstem and carries a characteristic set of fibres.

Step 1 – read the figure: The band marked X runs from the cerebellum up to the midbrain, which is where the red nucleus lies.

Step 2 – identify the peduncle: Only the **superior cerebellar peduncle** ascends to the midbrain and carries the main efferent outflow (dentate to contralateral red nucleus and thalamus).

Why the other options are wrong:

- A, Inferior cerebellar peduncle: connects to the medulla and carries olivocerebellar and spinocerebellar afferents.
- C, Middle cerebellar peduncle: connects to the pons and is almost purely afferent.
- D, Juxtarestiform body: a small vestibular part of the inferior peduncle, not the midbrain link.

Final Answer: Superior cerebellar peduncle $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q1

Q2.

Solution

Concept – middle cerebellar peduncle: It is the largest peduncle and connects the pons to the cerebellum.

Step 1 – trace the fibres: Pontine nuclei receive corticopontine input and project across the midline as **pontocerebellar (transverse pontine) fibres**.

Step 2 – confirm the direction: These fibres are afferent, entering the cerebellum through the middle peduncle.

Why the other options are wrong:

- A, Olivocerebellar fibres: enter through the inferior peduncle.
- C, Dentatorubral efferents: leave through the superior peduncle.
- D, Dorsal spinocerebellar fibres: enter through the inferior peduncle.

Final Answer: Pontocerebellar afferent fibres ⇒ B

Answer: (B) Go Back to Q2

Q3.

Solution

Concept – deep cerebellar nuclei: Four paired nuclei lie in the white matter; from medial to lateral they are fastigial, globose, emboliform and dentate.

Step 1 – name the largest: The **dentate nucleus** is the largest and belongs to the lateral (neocerebellar) zone that plans limb movement.

Step 2 – link to the signs: Its damage causes dysmetria and an intention tremor of the same-side limb.

Why the other options are wrong:

- A, Fastigial nucleus: linked to axial balance, not limb dysmetria.
- B, Emboliform nucleus: a small interposed nucleus.
- D, Globose nucleus: also a small interposed nucleus.

Final Answer: Dentate nucleus ⇒ C

Answer: (C) Go Back to Q3

Q4.

Solution

Concept – functional zones of the cerebellum: Each zone has a distinct connection and role.

Step 1 – match the vestibular link: The **flocculonodular lobe** is the vestibulocerebellum, wired to the vestibular nuclei.

Step 2 – state its function: It governs balance, equilibrium and eye movements during head motion.

Why the other options are wrong:

- A, Anterior lobe: the spinocerebellum, for trunk and limb tone.
- C, Posterior lobe: the neocerebellum, for skilled limb movement.
- D, Dentate nucleus: an output nucleus, not the vestibular zone.

Final Answer: Flocculonodular lobe ⇒ B

Answer: (B) Go Back to Q4

Q5.

Solution

Concept – the vermis and axial control: The midline vermis controls the trunk and proximal muscles used for standing and walking.

Step 1 – predict the deficit: A vermian tumour therefore disturbs trunk stability and gait.

Step 2 – describe the sign: The child shows **truncal ataxia** with a wide, staggering, broad-based gait.

Why the other options are wrong:

- B, Resting tremor: a basal ganglia sign, not cerebellar.
- C, Isolated pain loss: a sensory tract lesion, not vermian.
- D, Spastic hemiplegia: an upper motor neuron (corticospinal) sign.

Final Answer: Truncal ataxia and broad-based gait $\Rightarrow$ A

Answer: (A) Go Back to Q5

Q6.

Solution

Concept – the double-crossing rule: Cerebellar output crosses to the opposite red nucleus, and the corticospinal tract crosses again in the medulla.

Step 1 – apply the two crossings: Two decussations cancel out, so each cerebellar hemisphere ends up controlling the **same** (ipsilateral) side of the body.

Step 2 – give the answer: A right cerebellar lesion causes incoordination of the **right** limbs.

Why the other options are wrong:

- A, Left side: this would apply to cerebral (corticospinal) lesions.
- B, Both sides: only with a midline or bilateral lesion.
- C, No motor signs: cerebellar lesions clearly disturb coordination.

Final Answer: The right (ipsilateral) side $\Rightarrow$ D

Answer: (D) Go Back to Q6

Q7.

Solution

Concept – vestibular nuclei: Four vestibular nuclei lie in the floor of the fourth ventricle.

Step 1 – trace their input: They receive primary afferents from the vestibular ganglion of the **vestibulocochlear nerve (VIII)**.

Step 2 – note the function: This input signals head position and movement for balance and eye reflexes.

Why the other options are wrong:

- A, Trigeminal (V): carries facial sensation and jaw proprioception.
- B, Facial (VII): mainly motor to facial muscles plus taste.
- D, Glossopharyngeal (IX): supplies the pharynx, carotid body and posterior tongue taste.

Final Answer: Vestibulocochlear nerve (VIII) $\Rightarrow$ C

Answer: (C) Go Back to Q7

Q8.

Solution

Concept – fourth ventricle floor: The diamond-shaped floor is called the rhomboid fossa.

Step 1 – identify its walls: It is formed by the posterior surface of the **pons and the open (upper) part of the medulla**.

Step 2 – fix the roof for contrast: The roof (tent) is formed by the superior and inferior medullary vela and the cerebellum.

Why the other options are wrong:

- B, Cerebellum: forms the roof, not the floor.
- C, Midbrain tectum: roofs the cerebral aqueduct above.
- D, Thalamus: lies in the diencephalon, far from the fourth ventricle.

Final Answer: Pons and upper medulla $\Rightarrow$ A

Answer: (A) Go Back to Q8

Q9.

Solution

Concept – cerebellar clinical signs: Each sign has a precise name.

Step 1 – read the task: Rapid alternating movements (like pronation-supination) test the timing of opposing muscles.

Step 2 – name the failure: Inability to do them smoothly is **dysdiadochokinesia**, a classic cerebellar sign.

Why the other options are wrong:

- A, Dysmetria: misjudging the distance of a movement (past-pointing).
- B, Intention tremor: tremor worsening as the target is approached.
- C, Dysarthria: slurred, scanning speech.

Final Answer: Dysdiadochokinesia ⇒ D

Answer: (D) Go Back to Q9

Q10.

Solution

Concept – pharyngeal wall muscles: The muscular tube of the pharynx is built from an outer circular and an inner longitudinal layer.

Step 1 – name the outer layer: The **superior, middle and inferior constrictors** overlap from below upward and form the main wall.

Step 2 – link to swallowing: They contract in sequence to strip the bolus downward into the oesophagus.

Why the other options are wrong:

- A, Stylopharyngeus and its group: the longitudinal elevators, not the main wall.
- B, Cricothyroid: a laryngeal tensor of the vocal cords.
- D, Buccinator and orbicularis oris: muscles of the cheek and lips.

Final Answer: The three pharyngeal constrictors ⇒ C

Answer: (C) Go Back to Q10

Q11.

Solution

Concept – Killian's dehiscence: The inferior constrictor has two parts with a weak zone between them.

Step 1 – locate the gap: Between the thyropharyngeus and cricopharyngeus lies Killian's dehiscence, in the **inferior constrictor**.

Step 2 – link to the pouch: Mucosa herniates here to form a posterior Zenker's (pharyngeal) pouch.

Why the other options are wrong:

- B, Superior constrictor: too high; not the site of the dehiscence.
- C, Middle constrictor: attaches to the hyoid, above the weak zone.
- D, Stylopharyngeus: a longitudinal elevator, not a constrictor.

Final Answer: Inferior pharyngeal constrictor $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q11

Q12.

Solution

Concept – Waldeyer's ring: A ring of lymphoid tissue guards the openings into the pharynx.

Step 1 – list the components: It is formed by the **pharyngeal, tubal, palatine and lingual tonsils**.

Step 2 – note the arrangement: The pharyngeal tonsil lies above, the palatine tonsils at the sides, and the lingual tonsil below.

Why the other options are wrong:

- A, Deep cervical nodes: drain the region but do not form the ring.
- C, Submandibular glands: salivary tissue, not lymphoid.
- D, Thyroid and parathyroid: endocrine glands of the neck.

Final Answer: The four sets of tonsils $\Rightarrow$ $\boxed{B}$

Answer: (B) Go Back to Q12

Q13.

Solution

Concept – subdivisions of the pharynx: The pharynx is split into three parts by the soft palate and the epiglottis.

Step 1 – place the middle part: Between the soft palate above and the upper epiglottis below lies the **oropharynx**, marked X.

Step 2 – confirm its position: It opens forward into the oral cavity through the oropharyngeal isthmus.

Why the other options are wrong:

- A, Nasopharynx: above the soft palate, behind the nose.
- C, Laryngopharynx: below the epiglottis, behind the larynx.
- D, Cervical oesophagus: begins below the cricoid, beyond the pharynx.

Final Answer: Oropharynx $\Rightarrow$ B

Answer: (B) Go Back to Q13

Q14.

Solution

Concept – the piriform fossa: This mucosal recess flanks the laryngeal inlet in the laryngopharynx.

Step 1 – name the nerve beneath: The **internal laryngeal nerve** runs deep to its mucosa.

Step 2 – link to the clinical scenario: A lodged fish bone here can injure this nerve or trigger a cough reflex.

Why the other options are wrong:

- A, Recurrent laryngeal nerve: lies in the tracheo-oesophageal groove, lower down.
- B, External laryngeal nerve: supplies cricothyroid on the outer larynx.
- D, Glossopharyngeal nerve: relates to the tongue base and tonsil, not this fossa.

Final Answer: Internal laryngeal nerve $\Rightarrow$ C

Answer: (C) Go Back to Q14

Q15.

Solution

Concept – the odd muscle out: Almost all pharyngeal muscles take the vagus, but one is different.

Step 1 – name the exception: Stylopharyngeus is the only pharyngeal muscle supplied by the glossopharyngeal nerve (IX).

Step 2 – recall its action: It elevates the larynx and pharynx during swallowing and speech.

Why the other options are wrong:

- A, Superior constrictor: supplied by the pharyngeal plexus (vagus).
- B, Salpingopharyngeus: supplied by the pharyngeal plexus.
- C, Palatopharyngeus: supplied by the pharyngeal plexus.

Final Answer: Stylopharyngeus $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q15

Q16.

Solution

Concept – the pharyngeal plexus: Motor, sensory and sympathetic fibres mingle on the middle constrictor.

Step 1 – identify the motor root: The motor fibres of the plexus come from the **vagus nerve (X)**, via its cranial-accessory contribution.

Step 2 – note the exception: These supply every pharyngeal (and most palatal) muscle except stylopharyngeus.

Why the other options are wrong:

- A, Glossopharyngeal: gives the sensory root of the plexus, not the motor.
- C, Facial: supplies muscles of facial expression.
- D, Hypoglossal: supplies the tongue muscles.

Final Answer: Vagus nerve $\Rightarrow$ $\boxed{B}$

Answer: (B) Go Back to Q16

Q17.

Solution

Concept – layering in the popliteal fossa: Structures lie in a fixed superficial-to-deep order.

Step 1 – recall the order: From the skin inward: tibial nerve, then popliteal vein, then the **popliteal artery** lying deepest on the bone.

Step 2 – match X: The deepest structure marked X is therefore the popliteal artery.

Why the other options are wrong:

- A, Tibial nerve: the most superficial of the neurovascular contents.
- C, Popliteal vein: lies between the nerve and the artery.
- D, Common fibular nerve: runs at the lateral margin, not in the deep midline.

Final Answer: Popliteal artery $\Rightarrow$ B

Answer: (B) Go Back to Q17

Q18.

Solution

Concept – boundaries of the popliteal fossa: The diamond has muscular walls and a nerve along one edge.

Step 1 – follow the lateral edge: The **common fibular (common peroneal) nerve** runs along the medial border of the biceps femoris tendon, forming the superolateral boundary.

Step 2 – fix its course: It then passes over the fibular neck to enter the leg.

Why the other options are wrong:

- A, Tibial nerve: runs straight down through the middle of the fossa.
- B, Saphenous nerve: lies on the medial side of the leg, not in the fossa.
- C, Sural nerve: a cutaneous branch to the back of the leg and lateral foot.

Final Answer: Common fibular nerve $\Rightarrow$ D

Answer: (D) Go Back to Q18

Q19.

Solution

Concept – the patellar (knee-jerk) reflex: It is a monosynaptic stretch reflex of the quadriceps.

Step 1 – name the segments: The afferent and efferent limbs run through spinal segments **L3 and L4**, carried by the femoral nerve.

Step 2 – describe the arc: Tapping the patellar tendon stretches the quadriceps, and the reflex contracts it to extend the knee.

Why the other options are wrong:

- B, L5–S1: tests the ankle jerk (gastrocnemius/soleus) instead.
- C, S1–S2: also the ankle jerk range, not the knee.
- D, L1–L2: too high; relates to the cremasteric reflex.

Final Answer: L3 and L4 $\Rightarrow$ A

Answer: (A) Go Back to Q19

Q20.

Solution

Concept – the quadriceps femoris: This anterior thigh group is the main knee extensor.

Step 1 – name the nerve: The quadriceps is supplied by the **femoral nerve** (roots L2–L4).

Step 2 – confirm the action: Its contraction straightens the leg at the knee.

Why the other options are wrong:

- A, Sciatic nerve: supplies the hamstrings (knee flexors).
- B, Obturator nerve: supplies the medial (adductor) compartment.
- C, Tibial nerve: supplies the posterior leg (plantar flexors).

Final Answer: Femoral nerve $\Rightarrow$ D

Answer: (D) Go Back to Q20

Q21.

Solution

Concept – the genicular anastomosis: A network of vessels surrounds the knee to preserve flow in flexion.

Step 1 – name the main contributor: The **genicular branches of the popliteal artery** (superior, middle and inferior) form the bulk of the anastomosis.

Step 2 – note the helpers: Descending genicular and circumflex fibular branches also join in.

Why the other options are wrong:

- A, Femoral artery alone: contributes only the descending genicular branch.
- B, Obturator artery: supplies the medial thigh, not the knee network.
- D, Profunda femoris: supplies the thigh muscles, contributing little at the knee.

Final Answer: Genicular branches of the popliteal artery $\Rightarrow$ C

Answer: (C) Go Back to Q21

Q22.

Solution

Concept – the medial hamstrings: Two of the three hamstrings lie on the medial side.

Step 1 – name the pair: Semimembranosus and semitendinosus are the medial hamstrings.

Step 2 – relate to the fossa: Their tendons form the superomedial boundary of the popliteal fossa.

Why the other options are wrong:

- B, Biceps femoris: the lateral hamstring; popliteus is a deep floor muscle.
- C, Gracilis and sartorius: adductor and hip-flexor muscles, part of pes anserinus but not hamstrings.
- D, Gastrocnemius heads: form the inferior boundary, not the medial.

Final Answer: Semimembranosus and semitendinosus $\Rightarrow$ A

Answer: (A) Go Back to Q22

Q23.

Solution

Concept – popliteal artery aneurysm: An expansile pulsatile mass points to an arterial wall dilatation.

Step 1 – name the vessel: The **popliteal artery** is the commonest site of peripheral aneurysm and lies deep in the fossa.

Step 2 – explain the sign: Its expansile pulsation distinguishes an aneurysm from a simple (non-pulsatile) Baker's cyst.

Why the other options are wrong:

- A, Popliteal vein: a venous swelling is not expansile or pulsatile.
- B, Small saphenous vein: a superficial vein, not pulsatile.
- C, Femoral artery: lies in the femoral triangle, not the popliteal fossa.

Final Answer: Popliteal artery $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q23

Q24.

Solution

Concept – midgut arterial territory: The superior mesenteric artery supplies the derivatives of the midgut.

Step 1 – fix the distal limit: The midgut ends, and so does SMA supply, at the **junction of the proximal two-thirds and distal one-third of the transverse colon**.

Step 2 – read the figure: The dashed line X marks this boundary across the transverse colon.

Why the other options are wrong:

- A, Splenic flexure and left colon: these are hindgut, supplied by the IMA.
- B, Duodenojejunal flexure: marks the start, not the end, of the midgut.
- C, Upper rectum: the distal limit of the IMA, not the SMA.

Final Answer: Distal one-third of the transverse colon $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q24

Q25.

Solution

Concept – hindgut arterial territory: The inferior mesenteric artery supplies hindgut derivatives.

Step 1 – fix the distal limit: The IMA supplies down to the **upper part of the rectum** (superior rectal artery).

Step 2 – note the transition: Below this, the middle and inferior rectal arteries (from the internal iliac) take over.

Why the other options are wrong:

- B, Anal canal below the pectinate line: supplied by the inferior rectal artery.
- C, Second part of the duodenum: foregut/midgut territory.
- D, Caecum and appendix: midgut, supplied by the SMA.

Final Answer: Upper part of the rectum ⇒ A

Answer: (A) Go Back to Q25

Q26.

Solution

Concept – marginal artery of Drummond: A single vessel unites the two mesenteric supplies along the colon.

Step 1 – name it: The **marginal artery of Drummond** runs near the mesenteric border and links SMA and IMA branches.

Step 2 – note its value: It provides collateral flow if one main artery is blocked.

Why the other options are wrong:

- A, Arc of Riolan: a shorter, more central and inconstant SMA-IMA connection.
- B, Ileocolic artery: a single SMA branch to the caecum and appendix.
- D, Middle colic artery: a single SMA branch to the transverse colon.

Final Answer: Marginal artery of Drummond ⇒ C

Answer: (C) Go Back to Q26

Q27.

Solution

Concept – colonic watershed zones: Junctions between two arterial territories are vulnerable to ischaemia.

Step 1 – locate the splenic flexure zone: The SMA-IMA watershed at the splenic flexure is called **Griffith's point**.

Step 2 – link to disease: Low-flow states cause ischaemic colitis most often here.

Why the other options are wrong:

- A, Sudeck's point: the rectosigmoid watershed, lower down.
- B, Cannon–Böhm point: a neural transition in the transverse colon, not a vascular one.
- D, McBurney's point: a surface marking for the appendix base.

Final Answer: Griffith's point ⇒ C

Answer: (C) Go Back to Q27

Q28.

Solution

Concept – blood supply of the appendix: The appendix has one small end-artery.

Step 1 – trace the branch: The **appendicular artery** arises from the ileocolic artery, itself a branch of the SMA.

Step 2 – note the risk: Being an end-artery, its thrombosis in appendicitis leads to gangrene.

Why the other options are wrong:

- B, Right colic artery: supplies the ascending colon.
- C, SMA directly: the appendicular artery is not a direct SMA branch.
- D, Middle colic artery: supplies the transverse colon.

Final Answer: Ileocolic artery ⇒ A

Answer: (A) Go Back to Q28

Q29.

Solution

Concept – features of the large intestine: Three features distinguish colon from small bowel.

Step 1 – name the bands: The three longitudinal muscle bands are the **taeniae coli**.

Step 2 – explain the pouches: Because the taeniae are shorter than the gut, they gather the wall into sacculations called haustra.

Why the other options are wrong:

- A, Plicae circulares: circular mucosal folds of the small intestine.
- C, Appendices epiploicae: fatty tags on the colon surface, not muscle bands.
- D, Gastric rugae: folds of the stomach lining.

Final Answer: Taeniae coli $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q29

Q30.

Solution

Concept – sigmoid volvulus: Twisting needs a mobile loop on a narrow pivot.

Step 1 – identify the anatomy: The sigmoid colon hangs on a **long, mobile sigmoid mesocolon** whose root is narrow.

Step 2 – explain the twist: A long loop on a short base can rotate about its axis, obstructing and strangulating the bowel.

Why the other options are wrong:

- A, Fixed retroperitoneal position: fixed segments cannot twist.
- B, Short broad mesentery: a broad base resists rotation.
- C, Absence of taeniae coli: the taeniae are present and unrelated to volvulus.

Final Answer: Long mobile mesocolon on a narrow root $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q30

Q31.

Solution

Concept – formation of the neural tube: The nervous system begins as a folding of the ectoderm.

Step 1 – name the process: The plate-to-groove-to-tube sequence shown is called **neurulation**.

Step 2 – date it: It occurs in the third and fourth weeks of development.

Why the other options are wrong:

- B, Gastrulation: forms the three germ layers, earlier than neurulation.
- C, Segmentation: the division of mesoderm into somites.
- D, Canalisation: a later process forming the caudal cord.

Final Answer: Neurulation $\Rightarrow$ A

Answer: (A) Go Back to Q31

Q32.

Solution

Concept – neuropore closure: The tube zips shut, leaving two temporary openings.

Step 1 – identify X: X is the anterior (rostral) neuropore, which closes at about day 25.

Step 2 – predict the defect: If it stays open, the forebrain fails to form, giving **anencephaly**.

Why the other options are wrong:

- A, Spina bifida: follows failure of the posterior neuropore instead.
- C, Meckel's diverticulum: a gut (vitelline duct) remnant.
- D, Omphalocele: a defect of ventral body-wall folding.

Final Answer: Anencephaly $\Rightarrow$ B

Answer: (B) Go Back to Q32

Q33.

Solution

Concept – posterior neuropore: The caudal opening closes a little later than the rostral one.

Step 1 – date the closure: The posterior neuropore closes at about day 27.

Step 2 – predict the defect: Its failure leaves the caudal tube open, producing **spina bifida (myelomeningocele)**.

Why the other options are wrong:

- A, Anencephaly: from the anterior neuropore instead.
- B, Holoprosencephaly: a failure of forebrain cleavage, not neuropore closure.
- C, Microcephaly: a small brain from many causes, not this defect.

Final Answer: Spina bifida $\Rightarrow$ D

Answer: (D) Go Back to Q33

Q34.

Solution

Concept – neural crest cells: These migratory cells give rise to a wide, characteristic set of structures.

Step 1 – list the derivatives: They form **dorsal root ganglion neurons, melanocytes, the adrenal medulla and Schwann cells**, among others.

Step 2 – match the option: Option C groups three true neural crest derivatives together.

Why the other options are wrong:

- A, Anterior horn motor neurons: arise from the basal plate of the neural tube.
- B, Skeletal muscle: derived from somitic mesoderm.
- D, Notochord: forms from axial mesoderm, not neural crest.

Final Answer: Dorsal root ganglia, melanocytes and adrenal medulla $\Rightarrow$ C

Answer: (C) Go Back to Q34

Q35.

Solution

Concept – prevention of neural tube defects: One vitamin sharply reduces their incidence.

Step 1 – name it: Folic acid (folate) taken before and around conception lowers the risk.

Step 2 – give the practice point: Women are advised to start folate supplementation before pregnancy.

Why the other options are wrong:

- A, Vitamin A: excess is in fact teratogenic.
- C, Vitamin D: important for bone, not for neural tube closure.
- D, Vitamin K: needed for clotting factor synthesis.

Final Answer: Folic acid $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q35

Q36.

Solution

Concept – spectrum of spina bifida: Severity depends on what herniates through the defect.

Step 1 – match the description: When both meninges and neural tissue protrude, the lesion is a **meningomyelocele**.

Step 2 – grade the others: Occulta has no herniation; a meningocele contains meninges only.

Why the other options are wrong:

- A, Spina bifida occulta: only a bony defect, skin intact, no herniation.
- B, Meningocele: meninges herniate but neural tissue stays in place.
- C, Cranium bifidum: the equivalent defect in the skull, not the spine.

Final Answer: Meningomyelocele $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q36

Q37.

Solution

Concept – alar and basal plates: The neural tube divides into a dorsal sensory and a ventral motor half.

Step 1 – assign the alar plate: The **alar plate**, dorsal to the sulcus limitans, forms **sensory (afferent)** neurons.

Step 2 – contrast the basal plate: The ventral basal plate forms motor neurons.

Why the other options are wrong:

- A, Somatic motor neurons: derive from the basal plate.
- C, Preganglionic sympathetic neurons: from the intermediate (lateral) part of the basal plate.
- D, Notochordal cells: not a neural tube derivative at all.

Final Answer: Sensory (afferent) neurons $\Rightarrow$ B

Answer: (B) Go Back to Q37

Q38.

Solution

Concept – reading a stratified epithelium: Many layers with flat surface cells and no keratin point to one type.

Step 1 – identify it: This is **stratified squamous non-keratinised epithelium**, lining the oesophagus.

Step 2 – explain the design: The layers resist abrasion from swallowed food, while the moist surface stays flexible.

Why the other options are wrong:

- B, Simple columnar: a single tall layer, as in the stomach and intestine.
- C, Transitional epithelium: lines the urinary tract, with dome-shaped surface cells.
- D, Pseudostratified ciliated columnar: lines the airways, with cilia and goblet cells.

Final Answer: Stratified squamous non-keratinised epithelium $\Rightarrow$ A

Answer: (A) Go Back to Q38

Q39.

Solution

Concept – bone cells: Each cell type has a distinct location and role.

Step 1 – name the resident cell: The mature cell trapped in a lacuna, linked by canaliculi, is the **osteocyte**.

Step 2 – give its function: It senses mechanical strain and helps regulate matrix turnover.

Why the other options are wrong:

- A, Osteoblast: a surface cell that lays down new matrix.
- B, Osteoclast: a large multinucleate cell that resorbs bone.
- D, Osteoprogenitor cell: a stem cell that becomes an osteoblast.

Final Answer: Osteocyte $\Rightarrow$ C

Answer: (C) Go Back to Q39

Q40.

Solution

Concept – myelinating glia: Central and peripheral myelin are made by different cells.

Step 1 – name the CNS cell: The **oligodendrocyte** myelinates several axons at once in the central nervous system.

Step 2 – contrast with the PNS: A Schwann cell, by contrast, myelinates just one segment of one axon.

Why the other options are wrong:

- B, Schwann cell: myelinates peripheral axons, one per cell.
- C, Astrocyte: a supporting cell of the blood-brain barrier, not myelinating.
- D, Microglial cell: the resident macrophage of the CNS.

Final Answer: Oligodendrocyte $\Rightarrow$ A

Answer: (A) Go Back to Q40

Q41.

Solution

Concept – cells of the intestinal crypt: Different cell types occupy different levels of the crypt.

Step 1 – name the basal cell: At the crypt base, **Paneth cells** secrete lysozyme and defensins.

Step 2 – give their role: These antimicrobial products defend the crypt and protect the stem cells there.

Why the other options are wrong:

- A, Goblet cells: secrete mucus along the villi and crypts.
- B, Enteroendocrine cells: release gut hormones.
- D, Parietal cells: secrete acid in the stomach, not the intestine.

Final Answer: Paneth cells $\Rightarrow$ C

Answer: (C) Go Back to Q41

Q42.

Solution

Concept – anterior pituitary cell types: Staining divides the cells into acidophils and basophils.

Step 1 – name the acidophil products: Acidophils are somatotrophs and lactotrophs, secreting **growth hormone and prolactin**.

Step 2 – contrast the basophils: Basophils secrete ACTH, TSH, FSH and LH.

Why the other options are wrong:

- A, ACTH and TSH: basophil (corticotroph/thyrotroph) products.
- B, FSH and LH: basophil (gonadotroph) products.
- C, ADH and oxytocin: made in the hypothalamus, stored in the posterior pituitary.

Final Answer: Growth hormone and prolactin $\Rightarrow$ D

Answer: (D) Go Back to Q42

Q43.

Solution

Concept – the corpus luteum: After ovulation the follicle transforms into an endocrine body.

Step 1 – name the hormone: Its granulosa lutein cells secrete mainly **progesterone**.

Step 2 – give the purpose: Progesterone prepares and maintains the endometrium for implantation.

Why the other options are wrong:

- B, Testosterone: a testicular (Leydig cell) androgen.
- C, Thyroxine: a thyroid hormone.
- D, Aldosterone: from the adrenal cortex (zona glomerulosa).

Final Answer: Progesterone $\Rightarrow$ A

Answer: (A) Go Back to Q43

Q44.

Solution

Concept – achondroplasia: The commonest dwarfism has a specific gene and inheritance.

Step 1 – name the condition: Achondroplasia results from a gain-of-function mutation in FGFR3, which restrains cartilage growth at the physis.

Step 2 – give the inheritance: It is autosomal dominant, though many cases are new mutations.

Why the other options are wrong:

- B, Marfan syndrome: a fibrillin defect causing tall, thin stature.
- C, Osteogenesis imperfecta: a collagen defect causing brittle bones.
- D, Turner syndrome: a 45,X disorder with short stature but a different cause.

Final Answer: Achondroplasia $\Rightarrow$ A

Answer: (A) Go Back to Q44

Q45.

Solution

Concept – the sickle cell mutation: A single amino acid change produces abnormal haemoglobin S.

Step 1 – locate the change: Glutamate is replaced by valine at position 6 of the **beta-globin chain**.

Step 2 – explain the effect: Deoxygenated HbS polymerises, sickling the red cell.

Why the other options are wrong:

- A, Alpha-globin chain: its defects cause the alpha-thalassaemias.
- B, Gamma-globin chain: part of fetal haemoglobin (HbF).
- C, Delta-globin chain: part of the minor adult haemoglobin (HbA2).

Final Answer: The beta-globin chain $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q45

Q46.

Solution

Concept – Duchenne muscular dystrophy: Gower's sign and calf pseudohypertrophy in a boy are classic clues.

Step 1 – name the protein: The defective protein is **dystrophin**, which normally anchors the muscle cytoskeleton to the membrane.

Step 2 – link to the sign: Its absence causes progressive proximal weakness, so the child climbs up his legs to stand.

Why the other options are wrong:

- A, Fibrillin: defective in Marfan syndrome.
- C, Type I collagen: defective in osteogenesis imperfecta.
- D, Spectrin: defective in hereditary spherocytosis.

Final Answer: Dystrophin $\Rightarrow$ $\boxed{B}$

Answer: (B) Go Back to Q46

Q47.

Solution

Concept – DiGeorge syndrome: A microdeletion disturbs the third and fourth pharyngeal pouch derivatives.

Step 1 – name the locus: The deletion lies at **22q11.2**.

Step 2 – explain the features: Loss of pouch derivatives gives thymic aplasia (immune defect) and parathyroid aplasia (hypocalcaemia), with cardiac and facial anomalies.

Why the other options are wrong:

- B, 15q11–q13: Prader-Willi and Angelman syndromes.
- C, 5p15: Cri-du-chat syndrome.
- D, 7q11.23: Williams syndrome.

Final Answer: 22q11.2 $\Rightarrow$ A

Answer: (A) Go Back to Q47

Q48.

Solution

Concept – sesamoid bones: A sesamoid bone develops within a tendon.

Step 1 – identify the largest: The **patella**, in the quadriceps tendon, is the largest sesamoid bone of the body.

Step 2 – give its role: It increases the leverage of the quadriceps and protects the front of the knee joint.

Why the other options are wrong:

- A, Pisiform: a small sesamoid in the flexor carpi ulnaris tendon at the wrist.
- B, Fabella: a tiny, inconstant sesamoid behind the knee.
- D, Hamate: a carpal bone, not a sesamoid.

Final Answer: Patella $\Rightarrow$ C

Answer: (C) Go Back to Q48

Q49.

Solution

Concept – ossification of the clavicle: The clavicle is unusual in both its timing and its mode of ossification.

Step 1 – state the timing: The **clavicle** is the first bone in the body to begin ossifying, in the fifth to sixth week.

Step 2 – state the mode: It ossifies mainly by intramembranous ossification (with cartilage only at its ends).

Why the other options are wrong:

- A, Femur: ossifies endochondrally and later.
- B, Mandible: ossifies in membrane but slightly after the clavicle begins.
- D, Frontal bone: a membrane bone of the skull, but not the first to start.

Final Answer: Clavicle $\Rightarrow$ C

Answer: (C) Go Back to Q49

Q50.

Solution

Concept – the silhouette sign: A border is seen on X-ray only where lung air touches a soft-tissue edge.

Step 1 – apply it to the right heart border: The right heart border is formed against the **right middle lobe**; consolidation there replaces the air and erases the border.

Step 2 – read the sign: So loss of the right heart border localises the disease to the right middle lobe.

Why the other options are wrong:

- A, Right lower lobe: its consolidation obscures the right hemidiaphragm, not the heart border.
- C, Left lower lobe: lies behind the heart; it blurs the left hemidiaphragm.
- D, Lingula: its consolidation blurs the left heart border.

Final Answer: Right middle lobe $\Rightarrow$ B

Answer: (B) Go Back to Q50

Answer Key

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