INI CET Anatomy

Sample Paper – 7

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. A knife wound completely severs one optic nerve. Which visual field defect results?

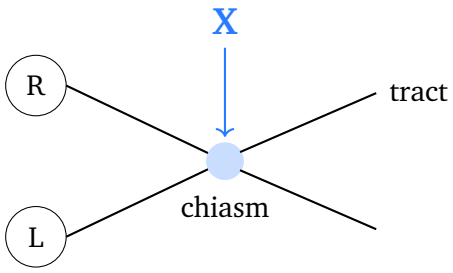
(A) Bitemporal hemianopia

(B) Contralateral homonymous hemianopia

(C) Total blindness of the ipsilateral (same-side) eye

(D) Superior homonymous quadrantanopia

Q2. The visual pathway is drawn below with a midline lesion **X** placed at the optic chiasm (as with an expanding pituitary tumour). The expected field defect is:



(A) Ipsilateral monocular blindness

(B) Contralateral homonymous hemianopia

(C) Right homonymous inferior quadrantanopia

(D) Bitemporal hemianopia

Q3. A lesion of the right optic tract (behind the chiasm) produces:

(A) Right monocular blindness

(B) Left homonymous hemianopia

(C) Bitemporal hemianopia

(D) Right nasal field loss only

Q4. Fibres of the optic radiation that sweep forward into the temporal lobe (Meyer's loop) are interrupted. The classic visual field defect is:

(A) Contralateral inferior homonymous quadrantanopia

(B) Contralateral superior homonymous quadrantanopia ("pie in the sky")

(C) Bitemporal hemianopia

(D) Central scotoma

Q5. The primary visual cortex (Brodmann area 17) is located along the walls of which sulcus?

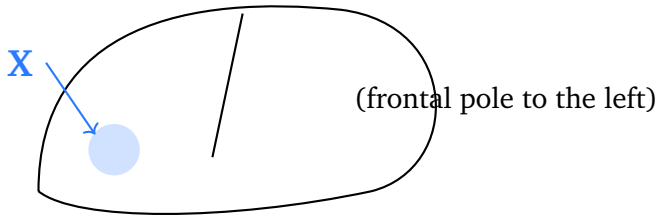
(A) Calcarine sulcus of the occipital lobe

(B) Central sulcus

(C) Lateral (Sylvian) sulcus

(D) Parieto-occipital sulcus

Q6. On the lateral surface of the left hemisphere below, the shaded region **X** is the cortical area whose damage causes a slow, effortful, non-fluent (expressive) aphasia with preserved comprehension. This area is the:



(A) Superior temporal gyrus (Wernicke's area)

(B) Arcuate fasciculus

(C) Inferior frontal gyrus (Broca's area)

(D) Angular gyrus

Q7. A patient speaks fluently but produces meaningless, nonsensical sentences and cannot understand spoken or written language. The lesion lies in the:

(A) Posterior part of the superior temporal gyrus (Wernicke's area)

(B) Inferior frontal gyrus (Broca's area)

(C) Precentral gyrus

(D) Calcarine cortex

Q8. A patient has fluent speech and intact comprehension, but repetition of a spoken phrase is severely impaired. This conduction aphasia is caused by a lesion of the:

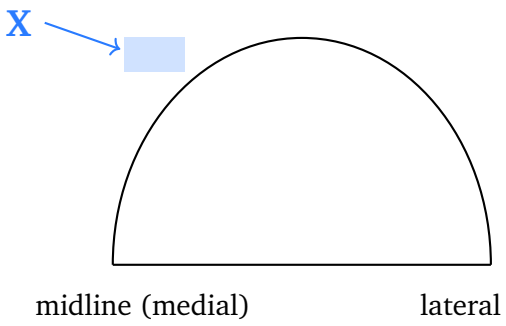
(A) Broca's area

(B) Wernicke's area

(C) Arcuate fasciculus

(D) Primary auditory cortex

Q9. In the coronal section of the precentral gyrus below, the motor homunculus area **X** for the lower limb lies over the medial surface of the hemisphere. This region is supplied by which artery?



(A) Middle cerebral artery

(B) Anterior cerebral artery

(C) Posterior cerebral artery

(D) Anterior choroidal artery

Head and Neck

Q10. The superior thyroid artery, the first artery to supply the upper pole of the thyroid gland, arises from the:

(A) External carotid artery

(B) Thyrocervical trunk

(C) Brachiocephalic trunk

(D) Internal carotid artery

Q11. The inferior thyroid artery, which supplies the lower pole of the thyroid gland, is a branch of the:

(A) External carotid artery

(B) Subclavian artery directly

(C) Thyrocervical trunk (of the subclavian artery)

(D) Costocervical trunk

Q12. During thyroidectomy the recurrent laryngeal nerve is most intimately and dangerously related, near the lower pole, to the:

(A) Inferior thyroid artery

(B) Superior thyroid artery

(C) Thyroid ima artery

(D) Common carotid artery

Q13. An occasional unpaired midline vessel ascending to the isthmus of the thyroid, the thyroid ima artery, most commonly arises from the:

(A) Aortic arch only

(B) Internal thoracic artery

(C) Superior thyroid artery

(D) Brachiocephalic (innominate) trunk

Q14. The external laryngeal nerve, which supplies the cricothyroid muscle, is at risk of injury during ligation of which vessel at the upper pole of the thyroid?

(A) Inferior thyroid artery

(B) Lingual artery

(C) Thyroid ima artery

(D) Superior thyroid artery

Q15. There are usually four parathyroid glands. The superior pair develops from the endoderm of which pharyngeal pouch?

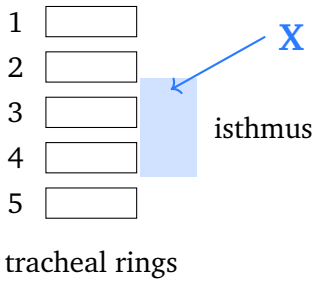
(A) Third pharyngeal pouch

(B) Fourth pharyngeal pouch

(C) Second pharyngeal pouch

(D) First pharyngeal pouch

Q16. In the diagram of the trachea below, the shaded band **X** is the isthmus of the thyroid gland. It normally lies across which tracheal rings?



(A) First tracheal ring only

(B) Second to fourth tracheal rings

(C) Fifth to seventh tracheal rings

(D) The cricoid cartilage

Upper and Lower Limb

Q17. The chief passive (ligamentous) support of the medial longitudinal arch of the foot, running from the sustentaculum tali to the navicular, is the:

(A) Plantar calcaneonavicular (spring) ligament

(B) Long plantar ligament

(C) Deltoid ligament

(D) Plantar aponeurosis

Q18. Which muscle is the most important dynamic (active) support of the medial longitudinal arch of the foot?

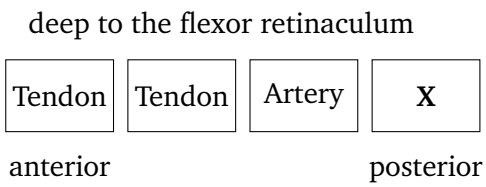
(A) Fibularis (peroneus) longus

(B) Tibialis posterior

(C) Tibialis anterior

(D) Flexor digitorum brevis

Q19. The box row below shows the contents of the tarsal tunnel behind the medial malleolus, arranged from anterior to posterior deep to the flexor retinaculum. The structure **X**, compressed in tarsal tunnel syndrome, is the:



(A) Common fibular nerve

(B) Tibial nerve

(C) Deep fibular nerve

(D) Sural nerve

Q20. The ligament most commonly torn in an inversion (lateral ankle) sprain is the:

(A) Deltoid ligament

(B) Calcaneofibular ligament

(C) Anterior talofibular ligament

(D) Posterior talofibular ligament

Q21. Inflammation of which structure, attached to the medial tubercle of the calcaneus, produces plantar fasciitis with sharp inferior heel pain on the first steps of the day?

(A) Spring ligament

(B) Long plantar ligament

(C) Calcaneal (Achilles) tendon

(D) Plantar aponeurosis (plantar fascia)

Q22. The dorsalis pedis pulse is best felt on the dorsum of the foot between the bases of which two metatarsals?

(A) First and second metatarsals

(B) Second and third metatarsals

(C) Third and fourth metatarsals

(D) Fourth and fifth metatarsals

Q23. The strong, fan-shaped ligament on the medial side of the ankle that chiefly resists excessive eversion of the foot is the:

(A) Anterior talofibular ligament

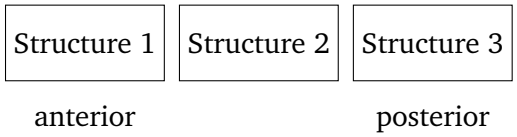
(B) Spring ligament

(C) Deltoid (medial) ligament

(D) Calcaneofibular ligament

Thorax, Abdomen and Pelvis

Q24. The box row below represents the three main structures in the renal hilum, arranged from anterior to posterior. Which sequence is correct?



(A) Renal vein – renal artery – renal pelvis

(B) Renal artery – renal vein – renal pelvis

(C) Renal pelvis – renal artery – renal vein

(D) Renal vein – renal pelvis – renal artery

Q25. The renal arteries arise from the abdominal aorta, just below the origin of the superior mesenteric artery, at approximately which vertebral level?

(A) T12

(B) L4

(C) L1–L2

(D) L3–L4

Q26. Which statement correctly describes the left renal vein compared with the right renal vein?

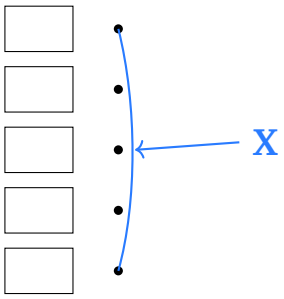
(A) It is shorter than the right renal vein

(B) It passes behind (posterior to) the aorta

(C) It receives the right gonadal vein

(D) It is longer, crosses in front of the aorta just below the superior mesenteric artery, and receives the left suprarenal and left gonadal veins

Q27. The lumbar column with a ureter traced along it is shown below. Line **X**, marking the abdominal course of the ureter on a plain radiograph, runs along the:



lumbar spine

(A) Lateral border of psoas with no bony landmark

(B) Tips of the lumbar transverse processes

(C) Mid-clavicular line

(D) Bodies of the lumbar vertebrae

Q28. The psoas major muscle arises from vertebrae L1–L3. Which nerve emerges along, and lies within the substance of, its lateral border?

(A) Obturator nerve

(B) Genitofemoral nerve

(C) Sciatic nerve

(D) Femoral nerve

Q29. Which of the following nerves is **not** a branch of the lumbar plexus?

(A) Femoral nerve

(B) Obturator nerve

(C) Sciatic nerve

(D) Genitofemoral nerve

Q30. The suprarenal (adrenal) gland has a three-source arterial supply: the superior suprarenal artery from the inferior phrenic artery, the middle suprarenal artery from the aorta, and the inferior suprarenal artery from the:

(A) Coeliac trunk

(B) Superior mesenteric artery

(C) Gonadal artery

(D) Renal artery

Embryology

Q31. The philtrum of the upper lip and the primary palate are formed by the midline fusion of the:

(A) Maxillary prominences

(B) Lateral nasal prominences

(C) Mandibular prominences

(D) Merged medial nasal prominences (the intermaxillary segment)

Q32. The ala (side/wing) of the nose develops from the:

(A) Medial nasal prominence

(B) Maxillary prominence

(C) Lateral nasal prominence

(D) Frontonasal prominence

Q33. The cheeks and the lateral parts of the upper lip are derived from the:

(A) Mandibular prominences

(B) Maxillary prominences

(C) Medial nasal prominences

(D) Lateral nasal prominences

Q34. The nasolacrimal duct forms from ectoderm buried within the nasolacrimal groove, which lies between which two prominences?

(A) The two medial nasal prominences

(B) Maxillary and mandibular prominences

(C) Maxillary and lateral nasal prominences

(D) Medial nasal and maxillary prominences

Q35. Treacher Collins syndrome (mandibulofacial dysostosis), with malar hypoplasia and mandibular underdevelopment, results from defective development of the:

(A) First pharyngeal arch

(B) Second pharyngeal arch

(C) Frontonasal prominence

(D) Third and fourth pharyngeal pouches

Q36. The forehead and the bridge (dorsum) of the nose are formed by the:

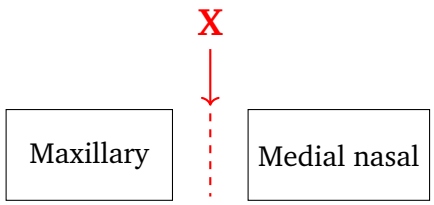
(A) Frontonasal prominence

(B) Maxillary prominences

(C) Lateral nasal prominences

(D) Mandibular prominences

Q37. In the diagram the maxillary prominence and the medial nasal prominence normally fuse. Failure of fusion at the gap marked **X** on one side produces:



(A) A cleft of the secondary palate

(B) A median cleft of the lip

(C) An oblique facial cleft

(D) A unilateral cleft of the upper lip

Histology

Q38. The mesothelium that lines the pleural, pericardial and peritoneal cavities is which type of epithelium?

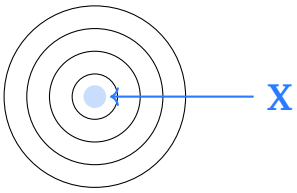
(A) Simple cuboidal epithelium

(B) Transitional epithelium

(C) Pseudostratified ciliated columnar epithelium

(D) Simple squamous epithelium

Q39. The concentric rings below represent an osteon (Haversian system) of compact bone. The central canal marked **X** normally contains:



concentric lamellae of an osteon

(A) Yellow bone marrow

(B) Blood vessels and nerves

(C) Osteoclasts only

(D) Hyaline cartilage matrix

Q40. Which glial cell sends perivascular foot processes that help form the blood-brain barrier and is identified immunohistochemically by glial fibrillary acidic protein (GFAP)?

(A) Astrocyte

(B) Oligodendrocyte

(C) Microglia

(D) Ependymal cell

Q41. Aggregated lymphoid follicles (Peyer's patches) with overlying antigen-sampling M cells are a characteristic feature of which part of the gut?

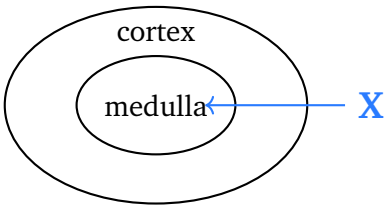
(A) Ileum

(B) Duodenum

(C) Stomach

(D) Sigmoid colon

Q42. In the cross-section of the suprarenal (adrenal) gland below, the catecholamine-secreting chromaffin cells of the central region **X** (the medulla) are best regarded as modified:



(A) Preganglionic parasympathetic neurons

(B) Postganglionic sympathetic neurons

(C) Cortical steroid-secreting cells

(D) Neural crest melanocytes

Q43. The contractile cells that surround the secretory alveoli of the mammary gland and contract to eject milk into the ducts are the:

(A) Plasma cells

(B) Adipocytes

(C) Myoepithelial cells

(D) Goblet cells

Genetics and Cytogenetics

Q44. Neurofibromatosis type 1, presenting with multiple café-au-lait spots and iris Lisch nodules, follows which inheritance pattern and maps to which chromosome?

(A) Autosomal dominant, chromosome 17

(B) Autosomal recessive, chromosome 22

(C) X-linked recessive, X chromosome

(D) Autosomal dominant, chromosome 22

Q45. Phenylketonuria, presenting with intellectual disability and a musty (mousy) body odour, results from deficiency of which enzyme?

(A) Homogentisate oxidase

(B) Branched-chain ketoacid dehydrogenase

(C) Tyrosinase

(D) Phenylalanine hydroxylase

Q46. Expression of a gene differing according to whether it was inherited from the mother or from the father is called:

(A) Anticipation

(B) Genomic imprinting

(C) Mosaicism

(D) Codominance

Q47. A karyotype reported as 45,X/46,XX in a girl with only mild Turner features represents:

(A) Complete Klinefelter syndrome

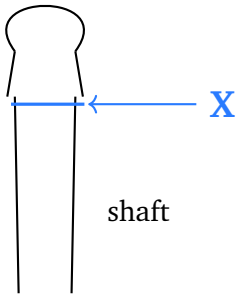
(B) Trisomy X

(C) Non-mosaic (classic) Turner syndrome

(D) Mosaic Turner syndrome

Osteology and Radiological Anatomy

Q48. In the diagram of the proximal humerus the fracture line **X**, a common site of injury that endangers the axillary nerve, is the surgical neck. It is located:



(A) Just distal to the greater and lesser tubercles

(B) At the junction of the head with the anatomical neck

(C) Immediately around the margin of the articular head

(D) At the mid-shaft in the spiral groove

Q49. The most prominent cervical spinous process, easily felt at the root of the neck and used as a surface landmark for counting vertebrae, belongs to which vertebra?

(A) T1

(B) C7 (vertebra prominens)

(C) C2

(D) T3

Q50. On a plain abdominal radiograph, obliteration (loss) of the normal psoas shadow suggests:

(A) A normal finding on full inspiration

(B) An anterior abdominal wall hernia

(C) Retroperitoneal pathology such as haemorrhage or abscess

(D) Free gas under the diaphragm

Detailed Solutions

Q1.

Solution

Concept – optic nerve lesion: The optic nerve carries all the fibres from one retina, before any of them cross at the chiasm.

Step 1 – trace the fibres: A complete section of one optic nerve interrupts every fibre coming from that single eye.

Step 2 – name the deficit: The result is total loss of vision in that eye alone, on the same (ipsilateral) side.

Why the other options are wrong:

- A, Bitemporal hemianopia: needs a lesion of the crossing fibres at the chiasm.
- B, Contralateral homonymous hemianopia: needs a lesion behind the chiasm (tract or radiation).
- D, Superior quadrantanopia: follows a temporal-lobe (Meyer's loop) lesion.

Final Answer: Total blindness of the ipsilateral eye $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q1

Q2.

Solution

Concept – optic chiasm: The chiasm carries the crossing fibres from the two nasal hemi-retinas.

Step 1 – identify the crossing fibres: Nasal retinal fibres, which serve the temporal halves of each visual field, decussate in the midline of the chiasm.

Step 2 – effect of the midline lesion X: A central chiasmal lesion cuts only these crossing fibres, so both temporal fields are lost, giving a bitemporal hemianopia.

Why the other options are wrong:

- A, Ipsilateral monocular blindness: an optic nerve lesion.
- B, Contralateral homonymous hemianopia: an optic tract lesion.
- C, Inferior quadrantanopia: a parietal optic-radiation lesion.

Final Answer: Bitemporal hemianopia $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q2

Q3.

Solution

Concept – optic tract: Beyond the chiasm each tract carries fibres serving the opposite half of the visual field.

Step 1 – content of the right tract: The right optic tract carries the right nasal and left temporal retinal fibres, that is, the left half of the visual field of both eyes.

Step 2 – name the deficit: A right tract lesion therefore causes a left (contralateral) homonymous hemianopia.

Why the other options are wrong:

- A, Right monocular blindness: an optic nerve lesion.
- C, Bitemporal hemianopia: a chiasmal lesion.
- D, Nasal field loss only: not produced by a tract lesion.

Final Answer: Left homonymous hemianopia $\Rightarrow$ B

Answer: (B) Go Back to Q3

Q4.

Solution

Concept – Meyer's loop: The inferior fibres of the optic radiation loop forward through the temporal lobe.

Step 1 – what these fibres carry: Meyer's loop carries information from the superior part of the contralateral visual field.

Step 2 – name the deficit: A temporal-lobe lesion of the loop causes a contralateral superior homonymous quadrantanopia, classically called "pie in the sky".

Why the other options are wrong:

- A, Inferior quadrantanopia: from a parietal-lobe (upper radiation) lesion.
- C, Bitemporal hemianopia: a chiasmal lesion.
- D, Central scotoma: a macular or optic-nerve problem.

Final Answer: Superior quadrantanopia ("pie in the sky") $\Rightarrow$ B

Answer: (B) Go Back to Q4

Q5.

Solution

Concept – primary visual cortex: The striate cortex (area 17) lies at the occipital pole.

Step 1 – locate it: It is folded into the upper and lower banks of the calcarine sulcus on the medial surface of the occipital lobe.

Step 2 – confirm the number: This striate cortex is Brodmann area 17, the target of the optic radiation.

Why the other options are wrong:

- B, Central sulcus: separates motor from sensory cortex.
- C, Lateral sulcus: borders the auditory cortex and insula.
- D, Parieto-occipital sulcus: marks a lobar boundary, not the visual cortex.

Final Answer: Calcarine sulcus $\Rightarrow$ A

Answer: (A) Go Back to Q5

Q6.

Solution

Concept – Broca's area: This motor speech area governs the production of fluent, well-articulated language.

Step 1 – locate X: The shaded area lies in the posterior part of the inferior frontal gyrus of the dominant hemisphere, which is Broca's area.

Step 2 – link to the deficit: Its damage gives a non-fluent (expressive) aphasia: speech is slow and effortful, but comprehension is preserved.

Why the other options are wrong:

- A, Wernicke's area: damage gives fluent aphasia with poor comprehension.
- B, Arcuate fasciculus: damage gives conduction aphasia (poor repetition).
- D, Angular gyrus: linked to alexia and agraphia.

Final Answer: Inferior frontal gyrus (Broca's area) $\Rightarrow$ C

Answer: (C) Go Back to Q6

Q7.

Solution

Concept – Wernicke's area: This sensory language area governs the comprehension of speech.

Step 1 – match the picture: Fluent but meaningless speech with lost comprehension is receptive (fluent) aphasia.

Step 2 – locate the lesion: It lies in the posterior part of the superior temporal gyrus of the dominant hemisphere, Wernicke's area.

Why the other options are wrong:

- B, Broca's area: gives non-fluent, effortful speech.
- C, Precentral gyrus: gives contralateral weakness, not aphasia.
- D, Calcarine cortex: gives a visual field defect.

Final Answer: Superior temporal gyrus (Wernicke's area) $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q7

Q8.

Solution

Concept – conduction aphasia: Repetition depends on the tract that links the sensory and motor language areas.

Step 1 – name the tract: The arcuate fasciculus connects Wernicke's area to Broca's area.

Step 2 – link to the deficit: Its interruption spares comprehension and fluent output but disconnects them, so repetition fails: conduction aphasia.

Why the other options are wrong:

- A, Broca's area: gives non-fluent aphasia.
- B, Wernicke's area: gives poor comprehension.
- D, Primary auditory cortex: gives a hearing deficit, not conduction aphasia.

Final Answer: Arcuate fasciculus $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q8

Q9.

Solution

Concept – motor homunculus and its blood supply: The body is mapped along the precentral gyrus, with the leg over the medial surface.

Step 1 – locate X: Region X for the lower limb sits on the medial surface of the hemisphere, in and around the paracentral lobule.

Step 2 – name the artery: The medial surface, including the leg area, is supplied by the anterior cerebral artery.

Why the other options are wrong:

- A, Middle cerebral artery: supplies the lateral surface (face and upper limb areas).
- C, Posterior cerebral artery: supplies the occipital visual cortex.
- D, Anterior choroidal artery: supplies deep structures such as the internal capsule and optic tract.

Final Answer: Anterior cerebral artery $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q9

Q10.

Solution

Concept – arterial supply of the thyroid: The gland has a paired superior and a paired inferior artery from different parents.

Step 1 – trace the superior thyroid artery: It is the first branch of the external carotid artery, arising just below the greater cornu of the hyoid.

Step 2 – confirm its territory: It descends to supply the upper pole of the thyroid gland.

Why the other options are wrong:

- B, Thyrocervical trunk: gives the inferior thyroid artery.
- C, Brachiocephalic trunk: gives the occasional thyroid ima artery.
- D, Internal carotid artery: has no branches in the neck.

Final Answer: External carotid artery $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q10

Q11.

Solution

Concept – inferior thyroid artery: The lower pole is supplied from the subclavian system, not the carotid.

Step 1 – trace the vessel: The inferior thyroid artery arises from the thyrocervical trunk, itself a branch of the first part of the subclavian artery.

Step 2 – confirm its course: It ascends and then turns medially to reach the lower pole of the gland.

Why the other options are wrong:

- A, External carotid: gives the superior thyroid artery.
- B, Subclavian directly: the branch is from its thyrocervical trunk, not the subclavian itself.
- D, Costocervical trunk: supplies the upper intercostal and deep neck muscles.

Final Answer: Thyrocervical trunk $\Rightarrow$ C

Answer: (C) Go Back to Q11

Q12.

Solution

Concept – recurrent laryngeal nerve and the inferior thyroid artery: At the lower pole the nerve and this artery cross intimately.

Step 1 – locate the relationship: Near the lower pole the recurrent laryngeal nerve passes just in front of, behind, or between the terminal branches of the inferior thyroid artery.

Step 2 – clinical point: This close relation makes the nerve vulnerable when the inferior thyroid artery is ligated during thyroidectomy.

Why the other options are wrong:

- B, Superior thyroid artery: related to the external laryngeal nerve at the upper pole.
- C, Thyroid ima artery: an inconstant midline vessel, not the key relation.
- D, Common carotid artery: lies laterally, not intimately crossing the nerve.

Final Answer: Inferior thyroid artery $\Rightarrow$ A

Answer: (A) Go Back to Q12

Q13.

Solution

Concept – thyroid ima artery: This is an inconstant unpaired vessel supplying the isthmus.

Step 1 – name its usual origin: When present, the thyroid ima artery most often arises from the brachiocephalic (innominate) trunk.

Step 2 – clinical relevance: Because it ascends in the midline in front of the trachea, it can bleed during a low tracheostomy.

Why the other options are wrong:

- A, Aortic arch only: a less common source, and stated too restrictively.
- B, Internal thoracic artery: an occasional but not the usual source.
- C, Superior thyroid artery: supplies the upper pole, not the ima vessel.

Final Answer: Brachiocephalic trunk $\Rightarrow$ D

Answer: (D) Go Back to Q13

Q14.

Solution

Concept – external laryngeal nerve at the upper pole: This nerve runs alongside the superior thyroid artery.

Step 1 – trace the relationship: The external laryngeal nerve descends with the superior thyroid artery to the upper pole before supplying the cricothyroid muscle.

Step 2 – clinical point: Ligating the superior thyroid artery too high can injure the nerve, weakening the cricothyroid and lowering vocal pitch.

Why the other options are wrong:

- A, Inferior thyroid artery: related to the recurrent laryngeal nerve, not the external branch.
- B, Lingual artery: supplies the tongue.
- C, Thyroid ima artery: a midline isthmic vessel, unrelated to this nerve.

Final Answer: Superior thyroid artery $\Rightarrow$ D

Answer: (D) Go Back to Q14

Q15.

Solution

Concept – development of the parathyroids: The two pairs come from different pharyngeal pouches, with a paradoxical final position.

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

Step 2 – contrast with the inferior pair: The inferior parathyroids arise from the third pouch and migrate further, ending up below the superior pair.

Why the other options are wrong:

- A, Third pouch: gives the inferior parathyroids and thymus.
- C, Second pouch: forms the palatine tonsil.
- D, First pouch: forms the tubotympanic recess (middle ear).

Final Answer: Fourth pharyngeal pouch $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q15

Q16.

Solution

Concept – thyroid isthmus: The isthmus connects the two lobes across the front of the trachea.

Step 1 – read the figure: Band X lies across the upper tracheal rings, spanning the second, third and fourth rings.

Step 2 – clinical relevance: This is why a tracheostomy is usually made below the isthmus, through the lower rings.

Why the other options are wrong:

- A, First ring only: too high and too narrow a span.
- C, Fifth to seventh rings: lies below the isthmus.
- D, Cricoid cartilage: lies above the first tracheal ring.

Final Answer: Second to fourth tracheal rings $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q16

Q17.

Solution

Concept – passive support of the medial arch: The keystone of the medial arch is the talar head, held up by a sling ligament.

Step 1 – name the ligament: The plantar calcaneonavicular (spring) ligament runs from the sustentaculum tali to the navicular, cradling the head of the talus.

Step 2 – confirm its role: It is the chief passive (ligamentous) support of the medial longitudinal arch.

Why the other options are wrong:

- B, Long plantar ligament: supports mainly the lateral arch.
- C, Deltoid ligament: stabilises the medial ankle joint, not the arch keystone.
- D, Plantar aponeurosis: a superficial tie-beam, not the spring ligament.

Final Answer: Spring ligament $\Rightarrow$ A

Answer: (A) Go Back to Q17

Q18.

Solution

Concept – dynamic support of the medial arch: An actively contracting muscle reinforces the ligaments during standing and walking.

Step 1 – name the muscle: Tibialis posterior, whose tendon fans out into the navicular and other tarsals, is the chief dynamic support of the medial arch.

Step 2 – clinical link: Its dysfunction leads to a progressive flatfoot (pes planus).

Why the other options are wrong:

- A, Fibularis longus: supports the lateral and transverse arches.
- C, Tibialis anterior: mainly dorsiflexes and inverts the foot.
- D, Flexor digitorum brevis: a small intrinsic flexor of the toes.

Final Answer: Tibialis posterior $\Rightarrow$ B

Answer: (B) Go Back to Q18

Q19.

Solution

Concept – tarsal tunnel: Behind the medial malleolus, structures run deep to the flexor retinaculum in a set order.

Step 1 – read the order: From anterior to posterior: tibialis posterior tendon, flexor digitorum longus tendon, posterior tibial artery, tibial nerve, flexor hallucis longus ("Tom, Dick, And Very Nervous Harry").

Step 2 – identify X: The structure behind the artery is the tibial nerve, compressed in tarsal tunnel syndrome.

Why the other options are wrong:

- A, Common fibular nerve: lies at the lateral fibular neck.
- C, Deep fibular nerve: runs on the front of the leg and dorsum of the foot.
- D, Sural nerve: is subcutaneous behind the lateral malleolus.

Final Answer: Tibial nerve $\Rightarrow$ B

Answer: (B) Go Back to Q19

Q20.

Solution

Concept – lateral ankle sprain: Inversion of the plantarflexed foot stresses the lateral ligament complex.

Step 1 – identify the weak link: Of the lateral ligaments, the anterior talofibular ligament is the weakest and the first to tear.

Step 2 – confirm the mechanism: An inversion injury therefore most commonly ruptures the anterior talofibular ligament.

Why the other options are wrong:

- A, Deltoid ligament: is medial and resists eversion, not inversion.
- B, Calcaneofibular ligament: torn only in more severe sprains, after the ATFL.
- D, Posterior talofibular ligament: the strongest and rarely torn.

Final Answer: Anterior talofibular ligament $\Rightarrow$ C

Answer: (C) Go Back to Q20

Q21.

Solution

Concept – plantar fasciitis: Heel pain arises from strain at the origin of a tough fibrous sheet on the sole.

Step 1 – name the structure: The plantar aponeurosis (plantar fascia) attaches to the medial tubercle of the calcaneus.

Step 2 – link to the picture: Its inflammation gives sharp inferior heel pain, worst on the first steps of the morning.

Why the other options are wrong:

- A, Spring ligament: supports the arch but is not the site of plantar fasciitis.
- B, Long plantar ligament: a deep ligament, not the fascia.
- C, Achilles tendon: its disorder causes posterior, not inferior, heel pain.

Final Answer: Plantar aponeurosis $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q21

Q22.

Solution

Concept – dorsalis pedis pulse: The artery runs a predictable course on the dorsum of the foot.

Step 1 – trace the artery: The dorsalis pedis artery passes from the ankle towards the first web space, lateral to the extensor hallucis longus tendon.

Step 2 – locate the pulse: It is felt between the bases of the first and second metatarsals.

Why the other options are wrong:

- B, C, D, Other metatarsal spaces: lie lateral to the artery's course, where the pulse is not felt.

Final Answer: First and second metatarsals $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q22

Q23.

Solution

Concept – medial ligament of the ankle: The medial side has one strong, triangular ligament.

Step 1 – name it: The deltoid (medial) ligament passes from the medial malleolus to the talus, calcaneus and navicular.

Step 2 – state its function: It is so strong that it resists eversion; excessive eversion tends to avulse the medial malleolus rather than tear the ligament.

Why the other options are wrong:

- A, Anterior talofibular ligament: a lateral ligament torn in inversion.
- B, Spring ligament: supports the arch, not the ankle joint eversion.
- D, Calcaneofibular ligament: a lateral ligament.

Final Answer: Deltoid (medial) ligament $\Rightarrow$ C

Answer: (C) Go Back to Q23

Q24.

Solution

Concept – renal hilum arrangement: The hilar structures lie in a fixed anteroposterior order.

Step 1 – state the order: From anterior to posterior: renal vein, then renal artery, then renal pelvis ("VAP").

Step 2 – match the figure: Structure 1 is the vein, structure 2 the artery, structure 3 the pelvis.

Why the other options are wrong:

- B: puts the artery first, which is wrong.
- C: puts the pelvis anteriorly, which is wrong.
- D: places the pelvis in the middle, which is wrong.

Final Answer: Vein – artery – pelvis $\Rightarrow$ A

Answer: (A) Go Back to Q24

Q25.

Solution

Concept – level of the renal arteries: The renal arteries branch just below the superior mesenteric artery.

Step 1 – fix the level: The superior mesenteric artery arises at L1; the renal arteries arise just below it, at about the L1–L2 level.

Step 2 – clinical note: Each renal artery is effectively an end-artery to its segment, so its occlusion infarcts that segment.

Why the other options are wrong:

- A, T12: the level of the coeliac trunk, above the renals.
- B, L4: the level of the aortic bifurcation.
- D, L3–L4: too low for the renal arteries.

Final Answer: L1–L2 $\Rightarrow$ C

Answer: (C) Go Back to Q25

Q26.

Solution

Concept – asymmetry of the renal veins: The left renal vein has a longer, more complex course.

Step 1 – describe the course: The left renal vein is longer and crosses in front of the aorta, in the angle beneath the superior mesenteric artery.

Step 2 – list its tributaries: Because of this course it receives the left suprarenal and left gonadal veins, which the right vein does not.

Why the other options are wrong:

- A: it is longer, not shorter, than the right.
- B: it passes in front of, not behind, the aorta.
- C: the right gonadal vein drains directly into the IVC.

Final Answer: Longer, crosses in front of the aorta, receives suprarenal and gonadal veins $\Rightarrow$ D

Answer: (D) Go Back to Q26

Q27.

Solution

Concept – radiological course of the ureter: The abdominal ureter follows a bony landmark on a plain film.

Step 1 – read line X: It runs downward over the tips of the lumbar transverse processes, lying on the psoas major.

Step 2 – confirm the use: This landmark helps trace the ureter and spot a calculus on a plain KUB radiograph.

Why the other options are wrong:

- A, Lateral border of psoas with no bony landmark: the transverse-process tips are the accepted landmark.
- C, Mid-clavicular line: a surface line of the trunk, not the ureter's course.
- D, Bodies of the lumbar vertebrae: the ureter runs lateral to the bodies, over the process tips.

Final Answer: Tips of the lumbar transverse processes ⇒ B

Answer: (B) Go Back to Q27

Q28.

Solution

Concept – psoas major and the femoral nerve: One large nerve is formed within the psoas muscle itself.

Step 1 – name the nerve: The femoral nerve forms within psoas major and emerges along its lateral border.

Step 2 – confirm the course: It then descends between psoas and iliacus to pass under the inguinal ligament into the thigh.

Why the other options are wrong:

- A, Obturator nerve: emerges from the medial border of psoas.
- B, Genitofemoral nerve: pierces and appears on the anterior surface of psoas.
- C, Sciatic nerve: is a branch of the sacral plexus, unrelated to psoas.

Final Answer: Femoral nerve ⇒ D

Answer: (D) Go Back to Q28

Q29.

Solution

Concept – branches of the lumbar plexus: The lumbar plexus (L1–L4) supplies a defined set of nerves.

Step 1 – list the lumbar branches: Iliohypogastric, ilioinguinal, genitofemoral, lateral cutaneous nerve of thigh, femoral and obturator nerves all arise from the lumbar plexus.

Step 2 – find the odd one out: The sciatic nerve arises from the sacral plexus (L4–S3), so it is not a lumbar plexus branch.

Why the other options are wrong:

- A, Femoral nerve: a lumbar plexus branch (L2–L4).
- B, Obturator nerve: a lumbar plexus branch (L2–L4).
- D, Genitofemoral nerve: a lumbar plexus branch (L1–L2).

Final Answer: Sciatic nerve (not a lumbar branch) $\Rightarrow$ C

Answer: (C) Go Back to Q29

Q30.

Solution

Concept – three-source supply of the suprarenal gland: The adrenal has an unusually rich, triple arterial supply.

Step 1 – list the three arteries: Superior suprarenal (from the inferior phrenic artery), middle suprarenal (from the aorta), and inferior suprarenal.

Step 2 – name the third parent: The inferior suprarenal artery arises from the renal artery.

Why the other options are wrong:

- A, Coeliac trunk: supplies the foregut, not the adrenal directly.
- B, Superior mesenteric artery: supplies the midgut.
- C, Gonadal artery: supplies the testis or ovary.

Final Answer: Renal artery $\Rightarrow$ D

Answer: (D) Go Back to Q30

Q31.

Solution

Concept – intermaxillary segment: The midline structures of the upper lip and palate come from the merged medial nasal prominences.

Step 1 – name the source: The two medial nasal prominences merge to form the intermaxillary segment.

Step 2 – list its derivatives: This segment forms the philtrum of the upper lip, the four incisor teeth region and the primary palate.

Why the other options are wrong:

- A, Maxillary prominences: form the lateral upper lip and cheeks.
- B, Lateral nasal prominences: form the alae of the nose.
- C, Mandibular prominences: form the lower lip and chin.

Final Answer: Merged medial nasal prominences $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q31

Q32.

Solution

Concept – lateral nasal prominence: Each side of the nose has its own prominence.

Step 1 – name the derivative: The lateral nasal prominence forms the ala (wing) of the nose.

Step 2 – contrast with the medial: The medial nasal prominences form the midline structures (bridge tip and philtrum region), not the ala.

Why the other options are wrong:

- A, Medial nasal prominence: forms midline nasal and lip structures.
- B, Maxillary prominence: forms the cheek and lateral upper lip.
- D, Frontonasal prominence: forms the forehead and nasal bridge.

Final Answer: Lateral nasal prominence $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q32

Q33.

Solution

Concept – maxillary prominence: This prominence forms the bulk of the mid-face on each side.

Step 1 – list its derivatives: The maxillary prominences form the cheeks and the lateral parts of the upper lip.

Step 2 – confirm the fusion: Each maxillary prominence fuses medially with the medial nasal prominence to complete the upper lip.

Why the other options are wrong:

- A, Mandibular prominences: form the lower lip and chin.
- C, Medial nasal prominences: form the philtrum (central upper lip).
- D, Lateral nasal prominences: form the alae of the nose.

Final Answer: Maxillary prominences $\Rightarrow$ $\boxed{B}$

Answer: (B) Go Back to Q33

Q34.

Solution

Concept – nasolacrimal groove: The tear duct forms where two prominences meet.

Step 1 – locate the groove: The nasolacrimal groove lies between the maxillary prominence and the lateral nasal prominence.

Step 2 – form the duct: Ectoderm in the floor of this groove sinks in and canalises to become the nasolacrimal duct.

Why the other options are wrong:

- A, Two medial nasal prominences: their fusion forms the philtrum, not the duct.
- B, Maxillary and mandibular prominences: their meeting forms the angle of the mouth.
- D, Medial nasal and maxillary prominences: their fusion completes the upper lip.

Final Answer: Maxillary and lateral nasal prominences $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q34

Q35.

Solution

Concept – Treacher Collins syndrome: This is a first-arch developmental defect.

Step 1 – name the arch: Treacher Collins syndrome (mandibulofacial dysostosis) results from faulty development of the first pharyngeal arch.

Step 2 – explain the features: It gives malar and mandibular hypoplasia, down-slanting palpebral fissures and external-ear defects.

Why the other options are wrong:

- B, Second arch: defects affect facial expression muscles and small ear ossicles, not this pattern.
- C, Frontonasal prominence: relates to nose and forehead anomalies.
- D, Third and fourth pouches: relate to parathyroid and thymic (DiGeorge) defects.

Final Answer: First pharyngeal arch $\Rightarrow$ A

Answer: (A) Go Back to Q35

Q36.

Solution

Concept – frontonasal prominence: The single midline prominence above the stomodeum forms the upper face.

Step 1 – name its derivatives: The frontonasal prominence forms the forehead and the bridge (dorsum) of the nose.

Step 2 – confirm the boundary: Its lower margins give rise to the medial and lateral nasal prominences around the nasal placodes.

Why the other options are wrong:

- B, Maxillary prominences: form the cheeks and lateral upper lip.
- C, Lateral nasal prominences: form the alae of the nose.
- D, Mandibular prominences: form the lower jaw and lip.

Final Answer: Frontonasal prominence $\Rightarrow$ A

Answer: (A) Go Back to Q36

Q37.

Solution

Concept – cleft lip: The upper lip closes where the maxillary and medial nasal prominences fuse.

Step 1 – read the gap X: The dashed gap marks failure of fusion between the maxillary prominence and the medial nasal prominence on one side.

Step 2 – name the defect: This produces a unilateral cleft of the upper lip.

Why the other options are wrong:

- A, Cleft of the secondary palate: results from failure of the palatine shelves to fuse.
- B, Median cleft lip: a rare defect from failure of the two medial nasal prominences to merge.
- C, Oblique facial cleft: from failure of fusion between maxillary and lateral nasal prominences.

Final Answer: Unilateral cleft lip $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q37

Q38.

Solution

Concept – mesothelium: Serous cavities are lined by a thin, friction-reducing epithelium.

Step 1 – name the epithelium: The pleura, pericardium and peritoneum are lined by mesothelium, which is a simple squamous epithelium.

Step 2 – explain the function: Its flat single layer and secreted serous fluid allow the surfaces to glide with minimal friction.

Why the other options are wrong:

- A, Simple cuboidal: lines small ducts and kidney tubules.
- B, Transitional: lines the urinary tract.
- C, Pseudostratified ciliated columnar: lines the airways.

Final Answer: Simple squamous epithelium (mesothelium) $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q38

Q39.

Solution

Concept – the osteon (Haversian system): Compact bone is built of concentric lamellae around a central canal.

Step 1 – identify X: The central (Haversian) canal marked X runs along the long axis of the osteon.

Step 2 – state its contents: It carries blood vessels and nerves; canaliculi radiate out to connect the osteocytes in their lacunae.

Why the other options are wrong:

- A, Yellow bone marrow: fills the medullary cavity, not the Haversian canal.
- C, Osteoclasts only: are found on resorbing surfaces, not filling this canal.
- D, Hyaline cartilage matrix: belongs to cartilage, not to compact bone.

Final Answer: Blood vessels and nerves $\Rightarrow$ B

Answer: (B) Go Back to Q39

Q40.

Solution

Concept – astrocytes and the blood-brain barrier: One glial cell wraps the capillaries of the central nervous system.

Step 1 – name the cell: The astrocyte sends perivascular foot processes onto capillaries, helping induce and maintain the blood-brain barrier.

Step 2 – confirm the marker: Astrocytes are identified by glial fibrillary acidic protein (GFAP).

Why the other options are wrong:

- B, Oligodendrocyte: myelinates central axons.
- C, Microglia: are the resident phagocytes of the CNS.
- D, Ependymal cell: lines the ventricles and central canal.

Final Answer: Astrocyte $\Rightarrow$ A

Answer: (A) Go Back to Q40

Q41.

Solution

Concept – Peyer's patches: Gut-associated lymphoid tissue is concentrated in one part of the small intestine.

Step 1 – name the site: Peyer's patches are aggregated lymphoid follicles in the mucosa and submucosa of the ileum.

Step 2 – note the M cells: The overlying M (microfold) cells sample luminal antigens and pass them to the underlying B-lymphocyte follicles.

Why the other options are wrong:

- B, Duodenum: characterised by Brunner's glands, not Peyer's patches.
- C, Stomach: has gastric glands, not lymphoid patches.
- D, Sigmoid colon: has solitary follicles but not the classic Peyer's patches.

Final Answer: Ileum $\Rightarrow$ A

Answer: (A) Go Back to Q41

Q42.

Solution

Concept – adrenal medulla: The medulla is really a modified sympathetic ganglion.

Step 1 – identify X: Region X is the central medulla, made of catecholamine-secreting chromaffin cells.

Step 2 – classify the cells: These chromaffin cells are modified postganglionic sympathetic neurons; they are driven directly by preganglionic sympathetic fibres and release adrenaline and noradrenaline into the blood.

Why the other options are wrong:

- A, Preganglionic parasympathetic neurons: unrelated to the medulla.
- C, Cortical steroid-secreting cells: belong to the surrounding cortex, not the medulla.
- D, Neural crest melanocytes: also neural-crest derived but pigment cells, not chromaffin cells.

Final Answer: Postganglionic sympathetic neurons $\Rightarrow$ B

Answer: (B) Go Back to Q42

Q43.

Solution

Concept – myoepithelial cells: Milk ejection needs a contractile cell around the secretory units.

Step 1 – name the cell: Myoepithelial cells lie between the secretory alveolar cells and their basement membrane.

Step 2 – state the function: Under oxytocin they contract and squeeze milk from the alveoli into the ducts.

Why the other options are wrong:

- A, Plasma cells: secrete antibodies into the milk but do not eject it.
- B, Adipocytes: form the fatty stroma of the breast.
- D, Goblet cells: are mucus-secreting cells of the gut and airway, absent here.

Final Answer: Myoepithelial cells $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q43

Q44.

Solution

Concept – neurofibromatosis type 1: A classic autosomal dominant neurocutaneous disorder.

Step 1 – state the inheritance: NF1 is inherited in an autosomal dominant pattern.

Step 2 – locate the gene: The NF1 gene lies on chromosome 17; features include café-au-lait spots, cutaneous neurofibromas and iris Lisch nodules.

Why the other options are wrong:

- B, Autosomal recessive, chromosome 22: wrong pattern and wrong locus.
- C, X-linked recessive: NF1 is autosomal, not X-linked.
- D, Autosomal dominant, chromosome 22: chromosome 22 (NF2) causes NF type 2, not NF1.

Final Answer: Autosomal dominant, chromosome 17 $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q44

Q45.

Solution

Concept – phenylketonuria: An autosomal recessive defect of amino-acid metabolism.

Step 1 – name the enzyme: PKU results from deficiency of phenylalanine hydroxylase, which normally converts phenylalanine to tyrosine.

Step 2 – link to the features: Accumulated phenylalanine and its metabolites cause intellectual disability and a musty (mousy) body and urine odour.

Why the other options are wrong:

- A, Homogentisate oxidase: its deficiency causes alkaptonuria.
- B, Branched-chain ketoacid dehydrogenase: its deficiency causes maple syrup urine disease.
- C, Tyrosinase: its deficiency causes albinism.

Final Answer: Phenylalanine hydroxylase $\Rightarrow$ D

Answer: (D) Go Back to Q45

Q46.

Solution

Concept – genomic imprinting: Some genes are expressed differently depending on the parent of origin.

Step 1 – define it: Genomic imprinting is the parent-of-origin-dependent silencing of one allele, so only the maternal or only the paternal copy is expressed.

Step 2 – give an example: Deletion of the same 15q region gives Prader-Willi syndrome if paternal and Angelman syndrome if maternal.

Why the other options are wrong:

- A, Anticipation: earlier or more severe disease over generations (trinucleotide repeats).
- C, Mosaicism: two cell lines from a post-zygotic error.
- D, Codominance: both alleles fully expressed together (as in AB blood group).

Final Answer: Genomic imprinting $\Rightarrow$ B

Answer: (B) Go Back to Q46

Q47.

Solution

Concept – mosaic Turner syndrome: Two cell lines can soften the Turner phenotype.

Step 1 – read the karyotype: 45,X/46,XX means some cells have a single X and others a normal pair of X chromosomes.

Step 2 – name the condition: This is mosaic Turner syndrome, often with milder features than the classic 45,X form.

Why the other options are wrong:

- A, Klinefelter syndrome: is 47,XXY, in a male.
- B, Trisomy X: is 47,XXX.
- C, Non-mosaic Turner: is a pure 45,X line, not a mosaic.

Final Answer: Mosaic Turner syndrome $\Rightarrow$ $\boxed{D}$

Answer: (D) Go Back to Q47

Q48.

Solution

Concept – surgical neck of the humerus: The proximal humerus has two "necks" that must be distinguished.

Step 1 – locate the surgical neck (X): The surgical neck is the constriction just distal to the greater and lesser tubercles, where the shaft narrows.

Step 2 – note the clinical risk: The axillary nerve and posterior circumflex humeral vessels wind around it, so a fracture here can cause deltoid paralysis.

Why the other options are wrong:

- B, Junction of head with anatomical neck: describes the anatomical neck, not the surgical neck.
- C, Margin of the articular head: is the anatomical neck.
- D, Mid-shaft spiral groove: is where the radial nerve, not the axillary nerve, is at risk.

Final Answer: Just distal to the tubercles $\Rightarrow$ $\boxed{A}$

Answer: (A) Go Back to Q48

Q49.

Solution

Concept – vertebra prominens: One cervical spinous process is easily palpable at the neck base.

Step 1 – name the vertebra: The long, non-bifid spinous process of C7 is the vertebra prominens.

Step 2 – state its use: It is felt at the root of the neck and used as a surface landmark for counting the vertebrae.

Why the other options are wrong:

- A, T1: its spinous process is prominent too, but C7 is the accepted counting landmark.
- C, C2: the axis lies deeper and is not the surface prominence.
- D, T3: lies at the level of the scapular spine, not the neck base.

Final Answer: C7 (vertebra prominens) ⇒ B

Answer: (B) Go Back to Q49

Q50.

Solution

Concept – the psoas shadow: The lateral border of psoas is normally visible on a plain abdominal film.

Step 1 – interpret the loss: Because fat outlines the muscle, obliteration of the psoas shadow means the fat plane has been replaced by fluid or tissue.

Step 2 – give the cause: Loss of the psoas outline suggests retroperitoneal pathology such as haemorrhage, abscess or a mass.

Why the other options are wrong:

- A, Normal on inspiration: the psoas outline is normally preserved, so its loss is abnormal.
- B, Anterior abdominal wall hernia: does not obliterate the retroperitoneal psoas line.
- D, Free gas under the diaphragm: indicates a perforated viscus, a different sign.

Final Answer: Retroperitoneal pathology ⇒ C

Answer: (C) Go Back to Q50

Answer Key

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