NEET MDS General Anatomy

Sample Paper – 6

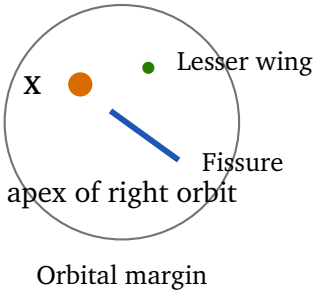
Duration: 11 Minutes **Maximum Marks: 56**

Instructions

- This paper contains **14** Multiple Choice Questions (Single Best Response), modelled on the General Anatomy including Embryology and Histology content of **NEET MDS** conducted by NBEMS.
- The **14-question** length matches the number of General Anatomy items you actually meet in the real 240-question paper.
- Each correct answer carries **+4 marks**. There is **negative marking of 1 mark** for every incorrect answer; unattempted questions carry no penalty.
- Every question has **exactly one best answer**. Choose the single most appropriate option.
- Attempt this practice paper in one timed sitting of about **11 minutes**, the pace the real computer-based test demands.

Head and Neck Osteology

Q1. The schematic below shows the apex of the right orbit from in front. The opening marked **X** lies in the lesser wing of the sphenoid, medial and superior to the fissure shown, and leads from the orbit into the middle cranial fossa. The pair of structures that passes through **X** is:



(A) The oculomotor and abducens nerves

(B) The optic nerve and the ophthalmic artery

(C) The maxillary nerve and the infraorbital artery

(D) The ophthalmic veins and the lacrimal nerve

Q2. You are studying the walls of the infratemporal fossa before a maxillary nerve block. The **medial wall** of the infratemporal fossa is formed by the:

(A) Ramus of the mandible

(B) Posterior surface of the body of the maxilla

(C) Infratemporal surface of the greater wing of the sphenoid

(D) Lateral pterygoid plate of the sphenoid

Q3. A patient who lost all upper posterior teeth eight months ago returns with a maxillary ridge that is markedly reduced in height, although the palate and the cheek bone are unchanged. The part of the maxilla that has resorbed is the:

(A) Frontal process

(B) Zygomatic process

(C) Alveolar process

(D) Palatine process

Cranial Nerves

Q4. Your inferior alveolar block has worked and the lower right first molar is pulp-tested numb, but the patient still feels the rubber dam clamp biting on the buccal gingiva of that molar. The nerve you must now block separately is the:

(A) Long buccal nerve, a sensory branch of the mandibular nerve

(B) Mental nerve, a terminal branch of the inferior alveolar nerve

(C) Nerve to mylohyoid, a branch of the inferior alveolar nerve

(D) Great auricular nerve, a branch of the cervical plexus

Q5. The nerve to mylohyoid supplies the mylohyoid muscle and the anterior belly of digastric. It arises from the:

(A) Lingual nerve, in the floor of the mouth

(B) Facial nerve, in the digastric groove

(C) Long buccal nerve, on the buccinator

(D) Inferior alveolar nerve, just before it enters the mandibular foramen

Q6. Two different nerves in the cheek are both called "buccal". Which statement correctly distinguishes the long buccal nerve from the buccal branch of the facial nerve?

(A) The long buccal nerve is sensory, from V3, to the cheek mucosa and buccal gingiva, while the buccal branch of the facial nerve is motor to buccinator

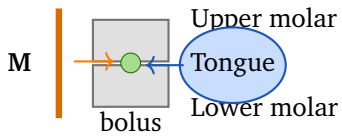
(B) The long buccal nerve is motor to buccinator, while the buccal branch of the facial nerve is sensory to the cheek mucosa

(C) Both are sensory, the long buccal nerve to the mucosa and the buccal branch of the facial nerve to the overlying skin

(D) Both are branches of the mandibular nerve, one arising above and one below the foramen ovale

Muscles, Temporomandibular Joint and Triangles of the Neck

Q7. The coronal section below passes through the molar region. The muscle marked **M** forms the whole thickness of the cheek wall and, working against the tongue, keeps the food bolus on the occlusal table during chewing. The motor supply of muscle **M** is the:



(A) Long buccal nerve

(B) Nerve to mylohyoid

(C) Buccal branch of the facial nerve

(D) Mental nerve

Q8. The occipital triangle is the larger upper part of the posterior triangle of the neck, lying above the inferior belly of omohyoid. Its floor, covered by the prevertebral fascia, is formed from above downwards by:

(A) Mylohyoid and hyoglossus

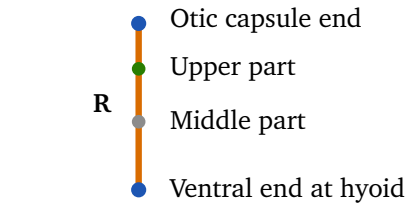
(B) Splenius capitis, levator scapulae and scalenus medius

(C) Sternohyoid and sternothyroid

(D) The middle and inferior constrictors of the pharynx

General Embryology and Pharyngeal Arches

Q9. The rod of cartilage marked **R** in the schematic below is the cartilage of the second pharyngeal arch, running from the otic capsule above to the hyoid below. The complete set of skeletal derivatives of **R** is:



second arch cartilage

(A) Stapes, styloid process, stylohyoid ligament and lesser cornu of the hyoid

(B) Malleus, incus and the sphenomandibular ligament

(C) Greater cornu and lower part of the body of the hyoid

(D) Thyroid, cricoid and arytenoid cartilages

Q10. After a total thyroidectomy the surgeon reports that the parathyroid glands lying **high** on the posterior surface of the thyroid lobes were preserved. Those superior parathyroid glands develop from the dorsal wing of the:

(A) Fourth pharyngeal pouch

(B) Third pharyngeal pouch

(C) Second pharyngeal pouch

(D) First pharyngeal pouch

Q11. A newborn has a cleft that involves the uvula and the soft palate and runs a short way into the back of the hard palate, but stops well behind the incisive foramen. The alveolus and lip are intact. This cleft is classified as:

(A) A cleft of the primary palate

(B) An incomplete cleft of the secondary palate

(C) A complete unilateral cleft of the primary and secondary palate

(D) A bilateral complete cleft of the primary and secondary palate

General Histology

Q12. The most numerous resident cell of connective tissue proper is spindle-shaped with a pale oval nucleus and abundant rough endoplasmic reticulum, and it secretes the procollagen that assembles outside the cell into collagen fibres. This cell is the:

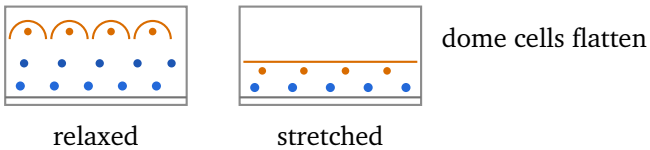
(A) Macrophage

(B) Fibroblast

(C) Plasma cell

(D) Adipocyte

Q13. The two panels below show the same epithelium from a hollow viscus, first relaxed and then stretched. In the relaxed state the surface cells bulge as domes and the epithelium looks thick; when stretched, the same cells flatten out and the epithelium thins without losing its barrier. This epithelium is:



(A) Simple cuboidal epithelium

(B) Pseudostratified columnar epithelium

(C) Stratified squamous non-keratinised epithelium

(D) Transitional epithelium (urothelium)

Vascular and Lymphatic Supply of the Head and Neck

Q14. A patient with a carcinoma of the palatine tonsil has a single hard node high in the deep cervical chain, at the point where the posterior belly of digastric crosses the internal jugular vein. That node is the:

(A) Submental node

(B) Jugulo-omohyoid node

(C) Jugulodigastric node

(D) Prelaryngeal node

Detailed Solutions

Q1.

Solution

Concept – the two openings at the apex of the orbit: The back of the orbit has one round canal and one long fissure, and each carries a fixed cargo.

Step 1 – read the bone given: The question places **X** in the **lesser wing of the sphenoid**, and the only opening in the lesser wing is the **optic canal**.

Step 2 – confirm with the position: The optic canal sits medial and superior to the superior orbital fissure, exactly as described, so **X** is the optic canal.

Step 3 – recall what the optic canal transmits: It carries the **optic nerve** inside its meningeal sheaths, and the **ophthalmic artery** running inferolateral to the nerve.

Step 4 – confirm the direction of travel: The nerve runs backwards from the orbit into the middle cranial fossa to reach the chiasma, while the artery runs forwards from the internal carotid into the orbit. Both use the same canal.

Why the other options are wrong:

- A, the oculomotor and abducens nerves: enter the orbit through the **superior orbital fissure**, the slit marked separately in the diagram.
- C, the maxillary nerve and infraorbital artery: run in the **infraorbital groove and canal** in the floor of the orbit, not at its apex in the lesser wing.
- D, the ophthalmic veins and lacrimal nerve: also pass through the **superior orbital fissure**, the veins draining back to the cavernous sinus.

Final Answer: The optic nerve and the ophthalmic artery $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q1

Q2.

Solution

Concept – the walls of the infratemporal fossa: The fossa is an irregular space behind the maxilla, and each of its four walls is a named bony plate.

Step 1 – take the roof: The roof is the infratemporal surface of the greater wing of the sphenoid, pierced by the foramen ovale and the foramen spinosum.

Step 2 – take the anterior wall: The anterior wall is the posterior surface of the body of the maxilla, which is why the tuberosity approach reaches this space.

Step 3 – take the lateral wall: The lateral wall is the ramus of the mandible, which is why you must go behind or below the ramus to enter the fossa.

Step 4 – take the medial wall, which is what is asked: What remains is the medial wall, and it is the **lateral pterygoid plate of the sphenoid**, from which the two pterygoid muscles arise.

Step 5 – link to the clinic: The lateral pterygoid plate is the landmark you walk off in a maxillary nerve block, because the pterygopalatine fossa lies just beyond its upper posterior edge.

Why the other options are wrong:

- A, the ramus of the mandible: forms the **lateral** wall, not the medial wall.
- B, the posterior surface of the maxilla: forms the **anterior** wall.
- C, the infratemporal surface of the greater wing of the sphenoid: forms the **roof**.

Final Answer: Lateral pterygoid plate of the sphenoid $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q2

Q3.

Solution

Concept – the four processes of the maxilla: The maxilla has a body and four processes, and only one of them is tooth-dependent.

Step 1 – name the processes: They are the frontal, zygomatic, palatine and **alveolar** processes.

Step 2 – identify the tooth-bearing part: The **alveolar process** is the ridge of bone that carries the tooth sockets and the periodontal ligament.

Step 3 – apply the rule of functional demand: Alveolar bone exists only to house teeth, and it is maintained by the forces the periodontal ligament transmits to it.

Step 4 – apply that rule to extraction: Once the teeth are extracted, the ligament is lost and the stimulus disappears, so the socket walls remodel and the ridge loses height and width over months.

Step 5 – confirm with the negative findings: The palate and the cheek bone are described as unchanged, which fits, because the palatine and zygomatic processes are not tooth-dependent and do not resorb.

Why the other options are wrong:

- A, the frontal process: runs upward to meet the frontal bone at the side of the nose and has nothing to do with teeth.
- B, the zygomatic process: is the buttress that meets the zygomatic bone, and the question states the cheek bone is unchanged.
- D, the palatine process: forms the front three quarters of the hard palate, and the question states the palate is unchanged.

Final Answer: Alveolar process $\Rightarrow$ C

Answer: (C) Go Back to Q3

Q4.

Solution

Concept – the buccal gingiva of lower molars has its own nerve: The inferior alveolar block does not cover the whole field around a lower molar.

Step 1 – list what the inferior alveolar block does cover: It anaesthetises the pulps of all the teeth of that half of the mandible, and, through the mental nerve, the labial gingiva and mucosa forward of the mental foramen, roughly up to the premolars.

Step 2 – read what is still painful: The pulp is numb, so the block worked, but the **buccal gingiva of the molar** still feels the clamp.

Step 3 – name the nerve of that gingiva: The buccal gingiva opposite the molars, and the mucosa of the cheek beside them, are supplied by the **long buccal nerve**, a sensory branch of the anterior division of the mandibular nerve (V3).

Step 4 – explain why the block missed it: The long buccal nerve leaves V3 high in the infratemporal fossa and travels forward between the two heads of lateral pterygoid onto the buccinator. It never enters the pterygomandibular space where your inferior alveolar solution was deposited, so it escapes the block.

Step 5 – state the fix: Infiltrate a small volume into the buccal fold distal and buccal to the molar. That is the long buccal nerve block.

Why the other options are wrong:

- B, the mental nerve: is a terminal branch of the inferior alveolar nerve and is therefore already anaesthetised by a successful block; it also supplies the labial gingiva anteriorly, not the molar buccal gingiva.
- C, the nerve to mylohyoid: is a motor nerve to mylohyoid and the anterior belly of digastric, so blocking it would not relieve gingival pain.
- D, the great auricular nerve: is a cutaneous branch of the cervical plexus

supplying skin over the parotid and lower ear, nowhere near the buccal gingiva.

Final Answer: Long buccal nerve, a sensory branch of the mandibular nerve $\Rightarrow$ A

Answer: (A) Go Back to Q4

Q5.

Solution

Concept – a motor branch from a mainly sensory trunk: The inferior alveolar nerve is thought of as sensory, but it gives off one motor twig before it disappears into bone.

Step 1 – trace the parent nerve: The inferior alveolar nerve arises from the posterior division of V3 and runs down between the ramus of the mandible and the sphenomandibular ligament.

Step 2 – find the branch point: Just before the parent nerve enters the **mandibular foramen**, it gives off the **nerve to mylohyoid**.

Step 3 – follow the branch: The nerve to mylohyoid pierces the sphenomandibular ligament, runs in the mylohyoid groove on the medial surface of the ramus, and reaches the lower surface of mylohyoid.

Step 4 – state its supply: It supplies **mylohyoid** and the **anterior belly of digastric**, both first arch muscles, which is exactly why their nerve comes from V3.

Step 5 – note the clinical point: Because it leaves *above* the foramen, it lies outside the usual deposit of an inferior alveolar block, and its accessory sensory twigs to the lower incisors are one reason a block can fail in the front of the mouth.

Why the other options are wrong:

- A, the lingual nerve: is a separate branch of the posterior division of V3, and it is sensory to the anterior two-thirds of the tongue and the lingual gingiva. It gives no branch to mylohyoid.
- B, the facial nerve: supplies the **posterior** belly of digastric, a second arch muscle, but not the anterior belly and not mylohyoid.
- C, the long buccal nerve: comes off the **anterior** division of V3 and is purely sensory to the cheek mucosa and buccal gingiva.

Final Answer: Inferior alveolar nerve, just before it enters the mandibular foramen $\Rightarrow$ D

Answer: (D) Go Back to Q5

Q6.

Solution

Concept – two "buccal" nerves, two different cranial nerves: The name is shared, but the origin, the modality and the target are all different.

Step 1 – take the long buccal nerve first: It arises from the **anterior division of the mandibular nerve (V3)**, passes between the two heads of lateral pterygoid, and spreads over the outer surface of buccinator.

Step 2 – state its modality and territory: It is purely **sensory**. It supplies the skin over buccinator, the mucous membrane lining the cheek, and the buccal gingiva of the lower molars and second premolar.

Step 3 – take the buccal branch of the facial nerve: It arises within the parotid gland from the facial nerve (VII), the nerve of the second pharyngeal arch, and runs forward across the face above and below the parotid duct.

Step 4 – state its modality and territory: It is purely **motor**. It supplies buccinator, orbicularis oris and the other muscles of facial expression in that region.

Step 5 – put the contrast together: The long buccal nerve *pierces* buccinator to reach the mucosa but does **not** supply the muscle; the facial nerve's buccal branch *supplies* the muscle but carries no sensation. Option A states exactly this.

Why the other options are wrong:

- B: reverses the two. Buccinator is a muscle of facial expression, so its motor nerve must be the facial nerve, never V3.
- C: is wrong because the facial nerve carries no cutaneous sensation to the cheek. Skin over the cheek is supplied by V2 and V3, including the long buccal nerve itself.
- D: is wrong because only the long buccal nerve comes from V3. The buccal branch of the facial nerve arises from the seventh cranial nerve inside the parotid and has no relation to the foramen ovale.

Final Answer: The long buccal nerve is sensory from V3, the buccal branch of the facial nerve is motor to buccinator $\Rightarrow$ A

Answer: (A) Go Back to Q6

Q7.

Solution

Concept – the muscle of the cheek: One muscle makes the whole cheek wall, and although it lies deep beside the teeth it is a muscle of facial expression.

Step 1 – identify M from the description: A muscle forming the full thickness of the cheek, lying between the skin and the oral mucosa opposite the molars, is the **buccinator**.

Step 2 – confirm with its attachments: Buccinator arises from the outer surfaces of the alveolar processes of the maxilla and mandible opposite the molars, and from the pterygomandibular raphe behind. Its fibres run forward into the modiolus at the angle of the mouth.

Step 3 – explain the action shown in the figure: When it contracts it presses the cheek inward against the teeth. The tongue pushes outward from the other side. Between the two, the food bolus is kept on the **occlusal table** instead of falling into the buccal vestibule.

Step 4 – settle its developmental origin: Buccinator is a muscle of **facial expression**, a derivative of the **second pharyngeal arch**, not one of the muscles of mastication.

Step 5 – derive the nerve from the origin: The nerve of the second arch is the facial nerve, so the motor supply of buccinator is the **buccal branch of the facial nerve**.

Step 6 – note the classic trap: The long buccal nerve of V3 lies on buccinator and pierces it, but only to reach the mucosa. It carries sensation, not motor fibres.

Why the other options are wrong:

- A, the long buccal nerve: is sensory to the cheek mucosa and buccal gingiva. It runs across buccinator but does not move it.
- B, the nerve to mylohyoid: supplies mylohyoid and the anterior belly of digastric in the floor of the mouth, not the cheek.
- D, the mental nerve: is the sensory terminal branch of the inferior alveolar nerve to the chin and lower lip, and it is not motor to anything.

Final Answer: Buccal branch of the facial nerve $\Rightarrow$ C

Answer: (C) Go Back to Q7

Q8.

Solution

Concept – the floor of a triangle is not the same as its boundaries: The boundaries of a triangle are its edges, while the floor is the muscular bed you cut down onto once you are inside it.

Step 1 – locate the occipital triangle: The inferior belly of omohyoid crosses the posterior triangle and divides it into a large upper **occipital triangle** and a small lower supraclavicular triangle.

Step 2 – work out what lies deep to it: The floor is built from the muscles of the side of the neck that lie deep to the investing layer, and it is carpeted by the prevertebral fascia.

Step 3 – name them from above downwards: Splenius capitis lies uppermost, then **levator scapulae**, and then **scalenus medius** at the lower part.

Step 4 – note the surgical point: Because the prevertebral fascia covers this floor, the accessory nerve and the cervical plexus branches lie *superficial* to it, within the roof and the fat of the triangle. That is exactly why a lymph node biopsy here can injure the accessory nerve.

Why the other options are wrong:

- A, mylohyoid and hyoglossus: form the floor of the **submandibular** triangle in the anterior triangle of the neck.
- C, sternohyoid and sternothyroid: are the infrahyoid strap muscles, which lie in the **muscular** triangle of the anterior triangle.
- D, the middle and inferior constrictors: form the wall of the pharynx and lie deep in the anterior triangle, not in the posterior triangle at all.

Final Answer: Splenius capitis, levator scapulae and scalenus medius $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q8

Q9.

Solution

Concept – Reichert's cartilage: The cartilage of the second pharyngeal arch is named Reichert's cartilage, and it contributes at both ends while regressing in the middle.

Step 1 – take the dorsal end, at the otic capsule: The dorsal end ossifies to form the **stapes**, the third and smallest ear ossicle. This is why stapedius, also a second arch structure, is supplied by the facial nerve.

Step 2 – take the next part down: The part just below ossifies as the **styloid process** of the temporal bone.

Step 3 – take the middle part: The middle part regresses. Its perichondrium persists as the fibrous **stylohyoid ligament**, running from the styloid process to the lesser cornu.

Step 4 – take the ventral end, at the hyoid: The ventral end ossifies as the **lesser cornu of the hyoid** and the **upper part of the body** of the hyoid.

Step 5 – assemble the list: Stapes, styloid process, stylohyoid ligament and lesser cornu of the hyoid. That is option A.

Step 6 – note the clinical link: Failure of the middle part to regress leaves an ossified stylohyoid ligament and an elongated styloid process, which is Eagle's syndrome.

Why the other options are wrong:

- B, malleus, incus and sphenomandibular ligament: are all derivatives of **Meckel's cartilage**, the **first** arch cartilage.
- C, the greater cornu and lower body of the hyoid: are **third** arch derivatives. The second arch takes only the lesser cornu and the upper body.
- D, the thyroid, cricoid and arytenoid cartilages: are derivatives of the **fourth and sixth** arches.

Final Answer: Stapes, styloid process, stylohyoid ligament and lesser cornu of the hyoid $\Rightarrow$ A

Answer: (A) Go Back to Q9

Q10.

Solution

Concept – the parathyroids and the crossing rule: The two pairs of parathyroid glands come from two different pouches, and their final positions are the reverse of their pouch numbers.

Step 1 – take the third pouch: Its dorsal wing forms the **inferior** parathyroid gland, and its ventral wing forms the thymus.

Step 2 – take the fourth pouch: Its dorsal wing forms the **superior** parathyroid gland. Its ventral wing gives the ultimobranchial body, whose cells become the parafollicular C cells of the thyroid.

Step 3 – explain the apparent reversal: The third pouch parathyroid is dragged

a long way down by the descending thymus, past the fourth pouch parathyroid, and ends up **below** it. The fourth pouch gland barely migrates and therefore stays high.

Step 4 – match to the question: The glands described sit *high* on the posterior surface of the thyroid lobes, so they are the superior parathyroids, and they came from the **fourth pharyngeal pouch**.

Step 5 – note the surgical consequence: Because it hardly migrates, the superior parathyroid has a fairly constant position near the cricothyroid junction. The inferior gland, with its long migration, is the one that turns up ectopically in the mediastinum.

Why the other options are wrong:

- B, the third pharyngeal pouch: gives the **inferior** parathyroid and the thymus, not the superior parathyroid.
- C, the second pharyngeal pouch: gives the crypts and surface epithelium of the **palatine tonsil**.
- D, the first pharyngeal pouch: gives the tubotympanic recess, that is the auditory tube and the middle ear cavity.

Final Answer: Fourth pharyngeal pouch $\Rightarrow$ A

Answer: (A) Go Back to Q10

Q11.

Solution

Concept – the incisive foramen is the dividing line: Clefts of the palate are classified by their relation to the incisive foramen, because that point separates two developmentally distinct structures.

Step 1 – define the primary palate: The primary palate is the part in **front** of the incisive foramen. It comes from the intermaxillary segment and carries the premaxilla with the four incisors, and it is continuous with the lip.

Step 2 – define the secondary palate: The secondary palate is everything **behind** the incisive foramen. It forms from the two palatine shelves of the maxillary processes, which fuse with each other from front to back, and it becomes the rest of the hard palate plus the whole soft palate and uvula.

Step 3 – apply the complete versus incomplete rule: Because the shelves fuse from front to back, a failure of fusion starts at the back. A cleft limited to the uvula and soft palate, or reaching only part way into the hard palate, is **incomplete**.

Only when the cleft runs the entire length and reaches the incisive foramen is it called **complete**.

Step 4 – apply the unilateral versus bilateral rule: Unilateral and bilateral describe how the cleft relates to the nasal septum and premaxilla in front of the incisive foramen, so those terms belong to clefts that involve the primary palate.

Step 5 – read the case: Lip and alveolus are intact, so the primary palate is normal. The cleft is behind the incisive foramen but stops short of it, so it is an **incomplete cleft of the secondary palate**.

Why the other options are wrong:

- A, a cleft of the primary palate: would involve the lip and the alveolus in front of the incisive foramen, and the question states both are intact.
- C, a complete unilateral cleft of the primary and secondary palate: would run from the lip and alveolus, past the incisive foramen, all the way back through the soft palate on one side. This cleft never reaches the incisive foramen at all.
- D, a bilateral complete cleft: would leave the premaxilla free in the midline with clefts on both sides of it, a picture quite unlike the one described.

Final Answer: An incomplete cleft of the secondary palate $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q11

Q12.

Solution

Concept – resident versus wandering cells of connective tissue: Connective tissue proper holds cells that live there permanently and cells that immigrate from blood, and each has a signature look.

Step 1 – use the abundance clue: The question says most numerous resident cell, and in connective tissue proper that is the **fibroblast**.

Step 2 – use the shape and nucleus clue: The fibroblast is flat and spindle-shaped, with long cytoplasmic processes and a pale, ovoid, euchromatic nucleus, the look of a cell actively transcribing.

Step 3 – use the organelle clue: Abundant rough endoplasmic reticulum and a large Golgi apparatus are the marks of a cell built to export protein, and that is exactly the fibroblast's job.

Step 4 – follow the collagen it makes: The fibroblast assembles procollagen inside the rough endoplasmic reticulum, hydroxylates its proline and lysine (a step

that needs vitamin C), and secretes it. Outside the cell, procollagen peptidases trim the ends to tropocollagen, which self-assembles into collagen fibrils and then fibres.

Step 5 – add the rest of its output: The same cell also makes elastin, reticular fibres and the ground substance glycosaminoglycans, so it builds the whole matrix, not just collagen.

Step 6 – link to the clinic: This is why fibroblasts drive wound healing, and why the quiescent form, the fibrocyte, has a smaller darker nucleus and much less rough endoplasmic reticulum.

Why the other options are wrong:

- A, the macrophage: comes from the blood monocyte, is phagocytic and antigen-presenting, and is packed with **lysosomes** rather than rough endoplasmic reticulum. It does not make collagen.
- C, the plasma cell: is derived from a B lymphocyte and does have abundant rough endoplasmic reticulum, but it is ovoid with a cartwheel nucleus and secretes **antibody**, not collagen.
- D, the adipocyte: is a large round cell filled by a single fat droplet that pushes the nucleus to the rim. It stores lipid and does not synthesise fibres.

Final Answer: Fibroblast $\Rightarrow$ B

Answer: (B) Go Back to Q12

Q13.

Solution

Concept – an epithelium that changes its own appearance: Most epithelia look the same whatever the organ is doing. One does not, and it is named for that.

Step 1 – read the key finding: The same epithelium looks thick and multi-layered when relaxed and thin and flat when stretched. Only **transitional epithelium**, also called urothelium, behaves this way.

Step 2 – read the surface cells: In the relaxed panel the surface cells bulge into the lumen as **domes**. These are the umbrella cells, and they are large, often binucleate, and cover several cells beneath them.

Step 3 – explain the mechanism: The luminal membrane of an umbrella cell is thickened into rigid plaques of uroplakin, joined by flexible hinges. When relaxed, spare plaque is stored as fusiform vesicles just under the surface. On stretching, those vesicles fuse into the membrane, so the cell flattens and gains surface area

without tearing.

Step 4 – explain why the barrier holds: The umbrella cells are locked together by very tight junctions, and the uroplakin plaques are impermeable, so hypertonic urine cannot leak back into the tissue however far the bladder distends.

Step 5 – place it anatomically: Transitional epithelium lines the urinary tract from the renal calyces through the ureter and bladder to the upper urethra, precisely the parts that must stretch.

Why the other options are wrong:

- A, simple cuboidal epithelium: is a single layer of box-shaped cells, seen in kidney tubules and gland ducts. The relaxed panel clearly shows several layers.
- B, pseudostratified columnar epithelium: only looks layered because its nuclei sit at different heights, but every cell touches the basement membrane. It lines the respiratory tract and does not stretch and thin like this.
- C, stratified squamous non-keratinised epithelium: is many layered and it does resist abrasion, but its surface cells stay flat and nucleated at all times. They never bulge as domes, and this epithelium lines the oesophagus and oral mucosa, not a distensible urinary viscus.

Final Answer: Transitional epithelium (urothelium) $\Rightarrow$ D

Answer: (D) Go Back to Q13

Q14.

Solution

Concept – the deep cervical chain along the internal jugular vein: Nearly all the lymph of the head and neck ends up in a single vertical chain, and two nodes of that chain are named for the muscles that cross the vein.

Step 1 – place the chain: The deep cervical nodes lie along the **internal jugular vein**, under cover of sternocleidomastoid, from the base of the skull to the root of the neck. They drain into the jugular lymph trunk.

Step 2 – name the upper landmark node: Where the **posterior belly of digastric** crosses the internal jugular vein, the chain carries a large node, the **jugulodigastric node**, also called the tonsillar node.

Step 3 – name the lower landmark node: Where the **inferior belly of omohyoid** crosses the vein, the chain carries the jugulo-omohyoid node, the main node of the tongue.

Step 4 – match the case to the landmark: The node in this patient is at the digastric crossing, so it is the jugulodigastric node.

Step 5 – confirm with the primary tumour: The jugulodigastric node is the first station for the **palatine tonsil**, which is exactly where this carcinoma is. It also drains the pharynx and much of the tongue, which is why it enlarges in ordinary tonsillitis as well.

Why the other options are wrong:

- A, the submental node: lies below the chin between the anterior bellies of digastric, and it drains the tip of the tongue, the lower lip and the lower incisors.
- B, the jugulo-omohyoid node: lies far lower, at the **omohyoid** crossing, and is the principal node of the tongue rather than the tonsil.
- D, the prelaryngeal node: sits on the cricothyroid membrane in the midline and drains the larynx below the vocal cords, not the tonsil.

Final Answer: Jugulodigastric node $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q14

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	D	3	C	4	A	5	D
6	A	7	C	8	B	9	A	10	A
11	B	12	B	13	D	14	C		