NEET MDS General Anatomy

Sample Paper – 10

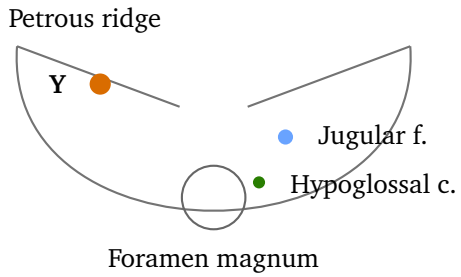
Duration: 11 Minutes **Maximum Marks: 56**

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. In the schematic of the posterior cranial fossa below, the canal marked **Y** opens on the posterior surface of the petrous part of the temporal bone and carries the labyrinthine artery along with two cranial nerves. The two nerves that pass through **Y** are:



(A) The glossopharyngeal and vagus nerves

(B) The trigeminal and abducent nerves

(C) The facial and vestibulocochlear nerves

(D) The vagus and accessory nerves

Q2. The ethmoidal air cells lie between the orbit and the nasal cavity and are grouped as anterior, middle and posterior. The **posterior** ethmoidal air cells drain into the:

(A) Inferior meatus

(B) Middle meatus, on the bulla ethmoidalis

(C) Superior meatus

(D) Sphenoethmoidal recess

Q3. The maxillary tuberosity is the rounded bony swelling at the posterior end of the alveolar process of the maxilla, and its posterior surface is pierced by small foramina for the posterior superior alveolar vessels. Immediately posteromedial to the tuberosity, separated from it by the pterygomaxillary fissure, lies the:

(A) Coronoid process of the mandible

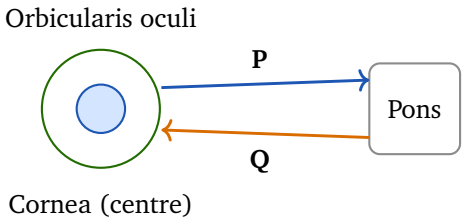
(B) Pterygoid process of the sphenoid, that is the pterygoid plates

(C) Styloid process of the temporal bone

(D) Zygomatic arch

Cranial Nerves

Q4. The loop below shows the corneal reflex. Touching the cornea with a wisp of cotton produces prompt bilateral closure of the eyelids. The limbs marked **P** (afferent) and **Q** (efferent) are carried respectively by:



(A) The facial nerve for **P** and the ophthalmic nerve for **Q**

(B) The ophthalmic nerve through its nasociliary branch for **P**, and the facial nerve for **Q**

(C) The optic nerve for **P** and the oculomotor nerve for **Q**

(D) The mandibular nerve for **P** and the facial nerve for **Q**

Q5. With the mouth held slightly open, a tap on the chin produces reflex elevation of the mandible. This jaw jerk is the only monosynaptic reflex among the cranial nerve reflexes. Its afferent and efferent limbs are carried by:

(A) The mandibular nerve for both limbs

(B) The maxillary nerve for the afferent limb and the mandibular nerve for the efferent limb

(C) The mandibular nerve for the afferent limb and the facial nerve for the efferent limb

(D) The mandibular nerve for the afferent limb and the hypoglossal nerve for the efferent limb

Q6. Touching the posterior wall of the oropharynx with a spatula makes the soft palate rise and the pharynx constrict. The afferent and efferent limbs of this gag reflex are carried respectively by the:

(A) Maxillary nerve and the glossopharyngeal nerve

(B) Glossopharyngeal nerve for both limbs

(C) Vagus nerve and the glossopharyngeal nerve

(D) Glossopharyngeal nerve and the vagus nerve

Muscles, Temporomandibular Joint and Triangles of the Neck

Q7. A patient cannot purse the lips to whistle and dribbles saliva from the angle of the mouth. The muscle at fault forms the sphincter of the oral fissure, has most of its fibres arising from the surrounding facial muscles

rather than from bone, and is supplied by the buccal and mandibular branches of the facial nerve. That muscle is the:

(A) Levator anguli oris

(B) Orbicularis oris

(C) Depressor anguli oris

(D) Risorius

Q8. The roots of the brachial plexus and the subclavian artery leave the neck together through a triangular interval in the floor of the posterior triangle. The boundaries of this interscalene gap are:

(A) Scalenus anterior in front, sternocleidomastoid behind, and the clavicle below

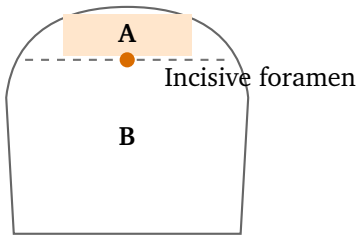
(B) Scalenus anterior in front, scalenus medius behind, and the first rib below

(C) Scalenus medius in front, scalenus posterior behind, and the first rib below

(D) Scalenus anterior in front, scalenus medius behind, and the clavicle below

General Embryology and Pharyngeal Arches

Q9. The palate is shown below from beneath, with the incisive foramen marked. This foramen is the landmark that separates two developmentally distinct parts of the palate. The part marked **A**, lying in front of the incisive foramen, is:



Hard palate, inferior view

(A) The secondary palate, formed by fusion of the two palatine shelves

(B) A derivative of the two lateral nasal processes

(C) The primary palate, the premaxilla, derived from the intermaxillary segment

(D) A derivative of the horizontal plates of the palatine bones alone

Q10. In the fourth week, a single median swelling appears in the floor of the primitive pharynx between the two lingual swellings of the first arch. It is largely overgrown by them and contributes little or nothing to the adult tongue, and its persistence at the surface has classically been linked with median rhomboid glossitis. This swelling is the:

(A) Copula

(B) Hypobranchial eminence

(C) Foramen caecum

(D) Tuberculum impar

Q11. At about the sixth week, the ectoderm lining the oral cavity thickens along each developing jaw into a horseshoe-shaped band that grows down into the underlying mesenchyme, and every tooth germ later arises from it. This structure is the:

(A) Dental lamina

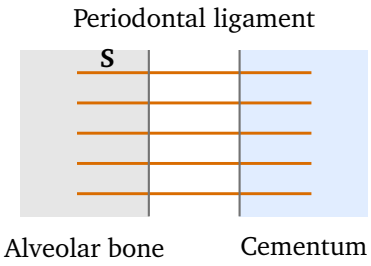
(B) Vestibular lamina

(C) Dental papilla

(D) Dental follicle

General Histology

Q12. In the section below, the collagen bundles marked **S** run out of the periodontal ligament and are embedded, calcified in place, into both the alveolar bone on one side and the cementum on the other. These perforating anchoring fibres are called:



(A) Elastic fibres of the periosteum

(B) Reticular fibres

(C) Oxytalan fibres

(D) Sharpey's fibres

Q13. The innermost lining of the tunica intima of every artery and vein, and the whole wall of a capillary apart from its basal lamina, is a single continuous layer of flattened cells sitting on a basement membrane. This lining is:

(A) Endothelium, which is a simple squamous epithelium

(B) Mesothelium, which lines the serous cavities

(C) A simple cuboidal epithelium

(D) A pseudostratified columnar epithelium

Vascular and Lymphatic Supply of the Head and Neck

Q14. A 58-year-old man has an ulcerated carcinoma confined to the tip of the tongue. The group of lymph nodes that receives the first lymphatic drainage from this site, and which also drains the central part of the lower lip and the floor of the mouth, is the:

(A) Submental group, which receives drainage from the tip of the tongue on both sides

(B) Submandibular group of the same side only

(C) Jugulodigastric node alone

(D) Occipital group

Detailed Solutions

Q1.

Solution

Concept – the openings of the posterior cranial fossa: Each opening in the floor and walls of the posterior fossa transmits a fixed set of nerves and vessels.

Step 1 – read the surface given: The question places **Y** on the **posterior surface of the petrous temporal bone**, not on the floor of the fossa.

Step 2 – name the opening on that surface: The only large canal opening on the posterior petrous surface is the **internal acoustic meatus**.

Step 3 – recall its contents: The internal acoustic meatus transmits the **facial nerve (VII)**, the **vestibulocochlear nerve (VIII)** and the **labyrinthine artery**.

Step 4 – confirm against the vessel clue: The question names the labyrinthine artery, a branch of the anterior inferior cerebellar artery, which travels with VII and VIII into the meatus. That clue fixes the canal as the internal acoustic meatus.

Step 5 – state the clinical link: A vestibular schwannoma grows in this meatus, which is why hearing loss and facial weakness appear together in that tumour.

Why the other options are wrong:

- A, the glossopharyngeal and vagus nerves: pass through the **jugular foramen**, which the diagram marks separately on the floor of the fossa.
- B, the trigeminal and abducent nerves: lie in the **middle** cranial fossa region, the trigeminal in its cave at the petrous apex and the abducent in Dorello's canal, not in the internal acoustic meatus.
- D, the vagus and accessory nerves: also leave through the **jugular foramen**, along with the glossopharyngeal nerve.

Final Answer: The facial and vestibulocochlear nerves $\Rightarrow$ C

Answer: (C) Go Back to Q1

Q2.

Solution

Concept – drainage of the ethmoidal air cells: The ethmoidal sinuses are not one cavity. They are three separate groups, and each group has its own drainage site.

Step 1 – take the anterior group: The anterior ethmoidal cells drain into the

middle meatus, through the ethmoidal infundibulum at the hiatus semilunaris.

Step 2 – take the middle group: The middle ethmoidal cells also drain into the **middle meatus**, but on to the summit of the bulla ethmoidalis.

Step 3 – take the posterior group, which is what is asked: The posterior ethmoidal cells drain into the **superior meatus**, above the superior concha's attachment.

Step 4 – fix the rule in memory: Anterior and middle cells drain into the middle meatus, so both are anterior group sinuses. The posterior cells go into the superior meatus, so they belong to the posterior group along with the sphenoid sinus.

Step 5 – add the clinical value: This is why posterior ethmoiditis gives discharge high in the nose and posterior nasal drip, whereas anterior cell infection gives discharge in the middle meatus.

Why the other options are wrong:

- A, the inferior meatus: receives only the **nasolacrimal duct**, and no paranasal sinus opens there.
- B, the middle meatus on the bulla ethmoidalis: is the drainage of the **middle** ethmoidal cells, not the posterior ones.
- D, the sphenoethmoidal recess: receives the **sphenoidal sinus** only.

Final Answer: Superior meatus $\Rightarrow$ C

Answer: (C) Go Back to Q2

Q3.

Solution

Concept – the maxillary tuberosity and its bony neighbours: The tuberosity is the back end of the maxilla, and knowing what sits behind it decides how safely you elevate an upper third molar.

Step 1 – place the tuberosity: It is the rounded eminence at the posterior end of the alveolar process, behind the socket of the upper third molar.

Step 2 – read its posterior surface: That surface is convex, faces posterolaterally into the infratemporal fossa, and is pierced by the alveolar canals for the posterior superior alveolar vessels and nerves.

Step 3 – look directly behind it: Behind the tuberosity stands the **pterygoid process of the sphenoid**, that is the lateral and medial pterygoid plates.

Step 4 – name the gap between them: The vertical cleft between the tuberosity

in front and the pterygoid process behind is the **pterygomaxillary fissure**, which leads into the pterygopalatine fossa.

Step 5 – use it clinically: Uncontrolled distal force on an upper third molar can fracture the tuberosity away from the maxilla, because the bone here is thin, cancellous and unsupported until it reaches the pterygoid plates.

Why the other options are wrong:

- A, the coronoid process of the mandible: lies **lateral** to the tuberosity, in front of the ramus, and slides forward over it when the mouth opens.
- C, the styloid process: projects downward and forward from the temporal bone far **behind and lateral** to the tuberosity, near the base of the skull.
- D, the zygomatic arch: is a lateral bar of bone well above the alveolar level and is not related to the tuberosity posteromedially.

Final Answer: Pterygoid process of the sphenoid $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q3

Q4.

Solution

Concept – reading a reflex arc by its two limbs: Every reflex has a sensory limb that carries the stimulus in and a motor limb that carries the response out, and the two need not be the same nerve.

Step 1 – identify the sensory receptor: The stimulus is a wisp of cotton on the **cornea**, so the receptor is a free nerve ending in corneal epithelium.

Step 2 – name the nerve that supplies the cornea: The cornea is supplied by the long ciliary nerves, which are branches of the **nasociliary nerve**, a branch of the ophthalmic division (V1) of the trigeminal nerve. So **P** is V1.

Step 3 – follow it centrally: These fibres reach the spinal nucleus of the trigeminal nerve in the pons and medulla, and interneurons carry the signal to the facial motor nuclei on **both** sides.

Step 4 – identify the muscle that responds: The blink is closure of the eyelids by **orbicularis oculi**, a muscle of facial expression.

Step 5 – name the nerve to that muscle: Orbicularis oculi is supplied by the temporal and zygomatic branches of the **facial nerve (VII)**. So **Q** is VII.

Step 6 – explain the bilateral response: Because the interneurons cross to both facial nuclei, touching one cornea shuts both eyes. Loss of the direct blink with a

preserved consensual blink localises the fault to VII on that side, while loss of both blinks on stimulating one cornea points to V1 on that side.

Why the other options are wrong:

- A: reverses the two limbs. The facial nerve is purely motor to the face here and carries no corneal sensation, so it cannot be the afferent limb.
- C: the optic nerve and oculomotor nerve form the arc for the **light reflex** of the pupil, not for corneal touch, and the oculomotor nerve raises the lid rather than closing it.
- D: the mandibular division (V3) supplies the skin over the mandible and the muscles of mastication, not the cornea.

Final Answer: Ophthalmic nerve (nasociliary) afferent, facial nerve efferent $\Rightarrow$ B

Answer: (B) Go Back to Q4

Q5.

Solution

Concept – the jaw jerk as a stretch reflex: The jaw jerk is a muscle stretch reflex, so it behaves exactly like a knee jerk, and a stretch reflex always runs in a single nerve.

Step 1 – identify the stimulus: A tap on the chin with the mouth open suddenly **stretches** the masseter and temporalis.

Step 2 – identify the receptor: The stretch is registered by **muscle spindles** inside the muscles of mastication.

Step 3 – trace the afferent limb: Spindle afferents run back in the nerves to masseter and temporalis, which are branches of the **mandibular nerve (V3)**. Their cell bodies are unusual, lying in the mesencephalic nucleus of the trigeminal nerve inside the brainstem rather than in the trigeminal ganglion.

Step 4 – cross the single synapse: The mesencephalic neuron synapses **directly** on the trigeminal motor nucleus with no interneuron in between. This is why the jaw jerk is the only monosynaptic cranial reflex, exactly the clue the question gives.

Step 5 – trace the efferent limb: Motor fibres leave the trigeminal motor nucleus and travel out again in the **mandibular nerve (V3)** to the muscles of mastication, which contract and close the jaw.

Step 6 – conclude and use it: Afferent and efferent are therefore both V3. Clini-

cally the jaw jerk is absent in a lower motor neuron lesion of V3 and exaggerated in an upper motor neuron lesion above the pons, which is why a brisk jaw jerk points the lesion above the mid-pons.

Why the other options are wrong:

- B: the maxillary nerve (V2) is purely sensory to the midface and carries no spindle afferents from the muscles of mastication.
- C: the facial nerve supplies the muscles of facial expression, which play no part in elevating the mandible.
- D: the hypoglossal nerve supplies the tongue muscles, not the elevators of the jaw.

Final Answer: Mandibular nerve for both limbs $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q5

Q6.

Solution

Concept – the gag reflex: The gag reflex is the standard bedside test of the ninth and tenth cranial nerves together, and each nerve owns one limb.

Step 1 – identify the stimulated area: The spatula touches the posterior wall of the oropharynx, the tonsillar region or the posterior third of the tongue.

Step 2 – name the sensory nerve of that area: General sensation from the oropharynx, tonsil and posterior third of the tongue is carried by the **glossopharyngeal nerve (IX)**. So IX is the afferent limb.

Step 3 – follow it centrally: The fibres reach the spinal trigeminal nucleus and the nucleus of the solitary tract, and interneurons pass to the nucleus ambiguus on both sides.

Step 4 – identify the motor response: The response is elevation of the soft palate and constriction of the pharynx, that is contraction of levator veli palatini and the pharyngeal constrictors.

Step 5 – name the motor nerve: Those muscles are supplied through the pharyngeal plexus by fibres from the nucleus ambiguus that travel in the **vagus nerve (X)**. So X is the efferent limb.

Step 6 – use it clinically: A unilateral vagal lesion leaves sensation intact but the uvula deviates **away** from the damaged side on gagging. A glossopharyngeal lesion abolishes the gag from that side while the palate still moves when the other side is touched.

Why the other options are wrong:

- A: the maxillary nerve supplies the **nasopharynx** and the palate mucosa in front, not the oropharyngeal wall, and the glossopharyngeal nerve is motor only to stylopharyngeus.
- B: the glossopharyngeal nerve cannot be both limbs, because its only motor supply is to stylopharyngeus and it does not run the palate or the constrictors.
- C: reverses the two limbs. The vagus does not carry the touch sensation being tested, and the glossopharyngeal nerve does not elevate the palate.

Final Answer: Glossopharyngeal nerve afferent, vagus nerve efferent $\Rightarrow$ D

Answer: (D) Go Back to Q6

Q7.

Solution

Concept – the sphincter of the mouth: Around each orifice of the face sits a sphincter of facial muscle, and the one around the oral fissure has a distinctive build.

Step 1 – read the shape clue: The question describes a muscle that **forms the sphincter of the oral fissure**, encircling the mouth in the substance of both lips.

Step 2 – read the attachment clue: Most of its fibres do not arise from bone. They are the decussating fibres of the neighbouring facial muscles, chiefly buccinator, converging at the modiolus lateral to the angle of the mouth.

Step 3 – read the nerve clue: It is supplied by the **buccal and mandibular branches of the facial nerve**, which is the supply of the muscle encircling the mouth.

Step 4 – put the three clues together: A bony-free sphincter around the oral fissure supplied by VII is the **orbicularis oris**.

Step 5 – match the symptoms: Its actions are closing, pursing and protruding the lips. Losing it means the patient cannot whistle, cannot hold a straw, and saliva escapes at the angle, exactly the picture in the stem.

Why the other options are wrong:

- A, levator anguli oris: arises from the canine fossa of the maxilla and **raises the angle** of the mouth. It is a bony-origin elevator, not a sphincter.
- C, depressor anguli oris: arises from the oblique line of the mandible and

pulls the angle of the mouth **down**. It also has a bony origin and no sphincteric ring.

- D, risorius: is a thin slip from the parotid fascia that pulls the angle **laterally** in a grin. Its pull is the opposite of pursing.

Final Answer: Orbicularis oris $\Rightarrow$ B

Answer: (B) Go Back to Q7

Q8.

Solution

Concept – the scalene muscles and the gap between them: The scalene muscles run from the cervical transverse processes to the upper two ribs, and the space between two of them is the doorway from the neck to the upper limb.

Step 1 – lay out the muscles: Scalenus anterior runs from the anterior tubercles of C3 to C6 to the scalene tubercle of the **first rib**. Scalenus medius runs from the posterior tubercles of C2 to C7 to the upper surface of the **first rib**, behind the groove for the subclavian artery.

Step 2 – define the interval they leave: Between the two muscles, with the first rib closing it below, is a triangular gap. This is the **interscalene gap** or scalene triangle.

Step 3 – list what goes through it: The **roots and trunks of the brachial plexus** and the **subclavian artery** pass through the gap and cross the first rib into the axilla.

Step 4 – note what does not: The subclavian **vein** passes **in front of** scalenus anterior, so it is outside the gap. That single fact separates artery from vein at this level and is a favourite examination point.

Step 5 – apply it: Thoracic outlet syndrome is compression in this very gap, from a cervical rib or a hypertrophied scalenus anterior, giving lower trunk symptoms in the hand and a weakened radial pulse, while the vein is often spared.

Why the other options are wrong:

- A: sternocleidomastoid lies **superficial** to scalenus anterior and forms the anterior boundary of the posterior triangle. It is not a wall of the interscalene gap.
- C: scalenus posterior is small, lies behind scalenus medius and inserts on the **second** rib. Nothing of importance passes between medius and posterior.
- D: the floor of the gap is the **first rib**, not the clavicle. The clavicle lies in

front of and above the gap and forms part of the separate costoclavicular space.

Final Answer: Scalenus anterior in front, scalenus medius behind, first rib below $\Rightarrow$ B

Answer: (B) Go Back to Q8

Q9.

Solution

Concept – the incisive foramen as a developmental boundary: The adult hard palate looks like one plate of bone, but it is built from two separate embryonic contributions that meet at the incisive foramen.

Step 1 – take the part in front of the foramen: This small triangular wedge carries the **four upper incisor teeth** and is the **premaxilla**.

Step 2 – trace where it came from: The two medial nasal processes fuse in the midline to form the **intermaxillary segment**. Its deepest part grows backwards as a wedge and becomes the **primary palate**, so region **A** in the figure is the primary palate.

Step 3 – take the part behind the foramen: Region **B**, behind the incisive foramen, is the **secondary palate**, formed by the two palatine shelves of the maxillary processes that swing horizontal and fuse with each other in the midline.

Step 4 – see how the two join: The palatine shelves also fuse in front with the primary palate, and the Y-shaped junction of these three fusion lines is centred on the **incisive foramen**.

Step 5 – read the answer off the figure: The question marks region **A** in front of the foramen, so the answer is the primary palate, that is the premaxilla from the intermaxillary segment.

Step 6 – keep the bones separate from the origin: Do not confuse origin with adult bone. The adult hard palate in front is maxilla and behind is palatine, but the developmental line does not follow that suture. It follows the incisive foramen.

Why the other options are wrong:

- A: the secondary palate is the part **behind** the incisive foramen, that is region B in the figure, not region A.
- B: the lateral nasal processes form the **alae of the nose** and take no part in building the palate.
- D: the horizontal plates of the palatine bones form only the **posterior quar-**

ter of the hard palate, well behind the incisive foramen.

Final Answer: The primary palate, the premaxilla from the intermaxillary segment ⇒ C

Answer: (C) Go Back to Q9

Q10.

Solution

Concept – the median swelling of the first arch: Among the swellings in the floor of the primitive pharynx, one is single and median, and its later fate is unusual.

Step 1 – read the position given: The swelling asked about is **median**, sits between the two lateral lingual swellings, and belongs to the **first** arch.

Step 2 – name it: That median swelling is the **tuberculum impar**, which simply means the unpaired tubercle.

Step 3 – follow its fate: The two lateral lingual swellings grow rapidly, overgrow the tuberculum impar and fuse with each other in the midline. The tuberculum is buried and contributes little or nothing recognisable to the adult tongue.

Step 4 – match the clinical clue: The classical teaching links **median rhomboid glossitis**, a smooth depapillated rhomboid patch just in front of the foramen caecum, to persistence of the tuberculum impar at the surface where the lingual swellings failed to cover it. This is exactly the clue in the stem.

Step 5 – keep the neighbours straight: The tuberculum impar is a first arch structure and lies in the anterior two-thirds. Do not confuse it with the third arch swelling behind the terminal sulcus.

Why the other options are wrong:

- A, the copula: is the median swelling formed by the **second** arch mesoderm. It is completely overgrown by the third arch and disappears, leaving no adult derivative.
- B, the hypobranchial eminence: is the **third and fourth** arch swelling that forms the posterior third of the tongue and the epiglottis. It lies behind the terminal sulcus, not between the lingual swellings.
- C, the foramen caecum: is not a swelling at all. It is the **pit** at the apex of the terminal sulcus marking the origin of the thyroglossal duct.

Final Answer: Tuberculum impar ⇒ D

Answer: (D) Go Back to Q10

Q11.

Solution

Concept – how tooth development starts: Every tooth germ in both jaws traces back to a single ectodermal band, and naming that band correctly is the first step of odontogenesis.

Step 1 – read the tissue of origin: The question says the **ectoderm lining the oral cavity** thickens. So the structure is epithelial, not mesenchymal.

Step 2 – read the shape and timing: It is a **horseshoe-shaped** band following the curve of each developing jaw, and it appears at about the **sixth week**.

Step 3 – read the direction of growth: It grows **down into the underlying mesenchyme**, invading the ectomesenchyme of the jaw rather than staying on the surface.

Step 4 – name it: A horseshoe-shaped ectodermal ingrowth along each jaw at week six, from which all tooth germs arise, is the **dental lamina**.

Step 5 – state what it does next: At ten fixed points along each dental lamina, the epithelium proliferates into buds, which become the tooth germs of the twenty deciduous teeth. Successional extensions from its lingual side later give the permanent successors, and free posterior extension gives the permanent molars.

Step 6 – note its end: The dental lamina breaks up once the germs are formed, leaving the epithelial rests of Serres in the gingiva, from which odontogenic cysts can later arise.

Why the other options are wrong:

- B, the vestibular lamina: is the second, more buccal ectodermal thickening that appears alongside the dental lamina. It splits to form the **oral vestibule** and forms no tooth.
- C, the dental papilla: is **ectomesenchymal**, not ectodermal, and it appears much later inside the cap of the enamel organ. It forms dentine and pulp.
- D, the dental follicle: is also **ectomesenchymal**. It condenses around the whole germ and forms cementum, periodontal ligament and alveolar bone.

Final Answer: Dental lamina $\Rightarrow$ A

Answer: (A) Go Back to Q11

Q12.

Solution

Concept – how soft tissue is anchored to hard tissue: Ligament and periosteum do not simply sit on bone. Their collagen bundles run into the mineralised tissue and are trapped there.

Step 1 – read what the fibres do in the figure: The bundles marked **S** leave the periodontal ligament and **enter** the alveolar bone on one side and the cementum on the other. They perforate the surface rather than stopping at it.

Step 2 – read how they are held: The question says they are **calcified in place**. As new bone or cementum is laid down, the mineral front simply engulfs the fibre ends, so the collagen becomes continuous with the matrix.

Step 3 – name them: Perforating collagen fibres embedded in bone or cementum in this way are **Sharpey's fibres**.

Step 4 – give their range: The same term applies wherever collagen anchors into bone. Periosteum is nailed to bone by Sharpey's fibres, and every principal fibre group of the periodontal ligament ends in Sharpey's fibres at both ends.

Step 5 – note the difference at the two ends: On the cementum side the fibres are numerous, closely packed and **fully mineralised**. On the bone side they are fewer, thicker and often only **partly mineralised** with an unmineralised core.

Step 6 – state the function: They convert the pull on a tooth into tension in the ligament and then into a load spread over the alveolar bone, which is why an intact ligament suspends the tooth rather than letting it hammer the socket.

Why the other options are wrong:

- A, elastic fibres of the periosteum: elastin is scanty in the periodontal ligament, and elastic fibres are not the anchoring bundles that enter bone.
- B, reticular fibres: are fine type III collagen networks that support cells in lymphoid organs, liver and bone marrow. They do not anchor ligament into bone.
- C, oxytalan fibres: are true residents of the periodontal ligament, and they do run into cementum, but they are immature **elastic-like** fibres oriented mainly around vessels. They are not the calcified perforating collagen bundles described here.

Final Answer: Sharpey's fibres $\Rightarrow$ D

Answer: (D) Go Back to Q12

Q13.

Solution

Concept – naming the lining of a blood vessel: Epithelia are named by layer count and cell shape, and the lining of vessels has its own special name on top of that.

Step 1 – count the layers: The question says a **single continuous layer** of cells on a basement membrane, so the epithelium is **simple**.

Step 2 – read the cell shape: The cells are **flattened**, so the shape is **squamous**.

Step 3 – combine the two: Simple plus squamous gives a **simple squamous epithelium**.

Step 4 – give it its site-specific name: When a simple squamous epithelium lines the heart, arteries, veins and capillaries, it is called **endothelium**.

Step 5 – confirm with the position given: The question places it as the innermost part of the tunica intima and as the entire capillary wall apart from the basal lamina, which is exactly where endothelium sits.

Step 6 – add why it matters: Being one flat cell thick is what allows gas and solute exchange across capillary walls, and the same cells produce nitric oxide and von Willebrand factor and keep the surface non-thrombogenic.

Why the other options are wrong:

- B, mesothelium: is also a simple squamous epithelium, but it is the name reserved for the lining of the **serous cavities**, that is pleura, pericardium and peritoneum. Vessels are not serous cavities.
- C, simple cuboidal epithelium: has cells as tall as they are wide and lines ducts, thyroid follicles and kidney tubules. Its thickness would obstruct capillary exchange.
- D, pseudostratified columnar epithelium: lines the trachea and bronchi, and although it sits on one basement membrane, its nuclei lie at different levels and its cells are tall, neither of which is described here.

Final Answer: Endothelium, a simple squamous epithelium $\Rightarrow$ A

Answer: (A) Go Back to Q13

Q14.

Solution

Concept – lymphatic drainage of the tongue by zone: The tongue does not drain as one unit. Each zone has its own first station, and that is what decides the neck dissection.

Step 1 – take the site given: The tumour is confined to the **tip** of the tongue.

Step 2 – name the first station for the tip: Lymph from the tip runs forward and down to the **submental nodes**, which lie in the submental triangle between the anterior bellies of the two digastrics, on the mylohyoid.

Step 3 – note the bilateral point: The tip sits at the midline, and its lymphatics cross freely. So drainage from the tip goes to the submental nodes of **both sides**, not just one, which is why a small tip lesion can throw up a contralateral node.

Step 4 – list what else these nodes take: The submental nodes also drain the **central part of the lower lip**, the **floor of the mouth**, the chin and the lower incisor gingiva, matching the second clue in the stem.

Step 5 – follow the chain onward: From the submental nodes lymph passes to the submandibular nodes and then to the deep cervical chain, especially the **jugulo-omohyoid node**, the classic node of the tongue.

Step 6 – apply it: Because the tip drains bilaterally, a carcinoma of the tip needs the neck assessed on **both** sides, whereas a lateral border lesion behaves as a same-side problem.

Why the other options are wrong:

- B, the same-side submandibular nodes only: they receive the **lateral** part of the anterior two-thirds of the tongue, and restricting the drainage to one side misses the bilateral spread from the midline tip.
- C, the jugulodigastric node alone: it is a deep cervical node of the upper group, the classic node for the **tonsil** and the posterior third. It is a later station for the tongue, not the first.
- D, the occipital group: drains the back of the scalp and has no connection with the mouth.

Final Answer: Submental group, bilaterally $\Rightarrow$ A

Answer: (A) Go Back to Q14

Answer Key

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