NEET PG Anatomy Sample Paper-9

Duration: 15 Minutes **Maximum Marks: 68**

Instructions

- This paper contains **17** Multiple Choice Questions.
- Each correct answer carries **+4** mark. Incorrect answer: **−1** marks. Only **one** correct option.
- Unattempted questions carry **0** marks.
- Use of mobile phones, smartwatches, or any electronic gadgets is strictly prohibited.

Q1. During an advanced retroperitoneal oncological resection to clear a bulky liposarcoma, a surgical oncology fellow inadvertently places a vascular clip across a small, inconsistent collateral channel running directly along the anterior surface of the crus of the diaphragm. Postoperatively, the patient develops profound ischemic changes localized strictly to the lower third of the esophagus. Which anomalous or highly variant arterial source was most likely compromised by the clip?

(A) Variant left inferior phrenic artery arising directly from the celiac trunk

(B) Direct accessory esophageal branch originating from an aberrant left hepatic artery

(C) Accessory posterior gastric artery branching from the splenic artery hilum

(D) Anomalous direct aortic branch arising superior to the celiac axis origin

Q2. A 62-year-old patient presents with sudden-onset neurological deficits characterized by dysarthria, dysphagia, loss of pain and temperature sensation on the left side of the face, and loss of pain and temperature sensation on the right side of the trunk and limbs. MRI demonstrates a localized infarct in the dorsolateral medulla. A high-resolution microvascular angiogram reveals an isolated structural variant. Which vessel configuration is the most probable site of this specific occlusive event?

(A) Occlusion of the anterior spinal artery at its junction point

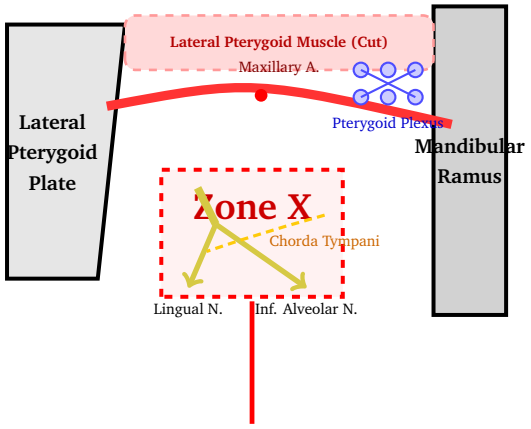
(B) Isolated thrombotic occlusion of the posterior inferior cerebellar artery (PICA) lateral medullary branch

(C) Thromboembolism restricted to the paramedian perforating branches of the basilar artery

(D) Dissection of the short circumferential branches of the anterior inferior cerebellar artery (AICA)

Q3. A senior maxillofacial surgeon is performing a radical dissection within the infratemporal fossa to excise a deep-seated schwannoma. The surgeon utilizes the structural relationships within the pterygomaxillary fissure as a critical landmark. Analyze the cross-sectional schematic diagram of the infratemporal region provided below. Identify the deep structural layer indicated by the bold arrow pointing to **Zone X**:

Infratemporal Fossa Corridor (Deep Cross-Section)



Target Zone X Corridor

(A) Otic ganglion lying medial to the trunk of the mandibular nerve (V_3)

(B) Chorda tympani nerve merging with the lingual nerve in the upper interpterygoid space

(C) Sphenomandibular ligament attachment site at the lingula of the mandible

(D) Deep temporal nerves ascending to track the deep surface of the temporalis muscle

Q4. An orthopedic trauma team evaluates a patient with an unstable posterior

fracture-dislocation of the hip joint. Post-reduction imaging shows entrapment of osteochondral fragments within the acetabular fossa. During the posterior surgical exposure (Kocher-Langenbeck approach), the surgeon must carefully identify and preserve the structural integrity of the main vascular supply preventing avascular necrosis of the femoral head. Which anatomical statement correctly identifies the primary terminal source providing the majority of this specific perfusion in adult life?

(A) Foveolar artery running inside the ligamentum teres derived from the obturator artery

(B) Ascending cervical branches (retinacular arteries) arising from the medial femoral circumflex artery

(C) Descending nutrient branches originating from the first perforating branch of the profunda femoris artery

(D) Superior gluteal artery anastomotic terminal branches running deep to the gluteus minimus

Q5. A neonate presenting with severe respiratory distress is diagnosed with an atypical variant of a congenital diaphragmatic hernia. Diagnostic laparoscopy reveals that the defect is localized strictly to the left posterolateral aspect of the diaphragm, leading to herniation of the stomach and splenic flexure into the hemithorax. This structural pathology is primarily caused by the failed embryological fusion or defective muscularization of which embryonic structural component?

(A) Pleuroperitoneal membranes failing to close the pleuroperitoneal canals

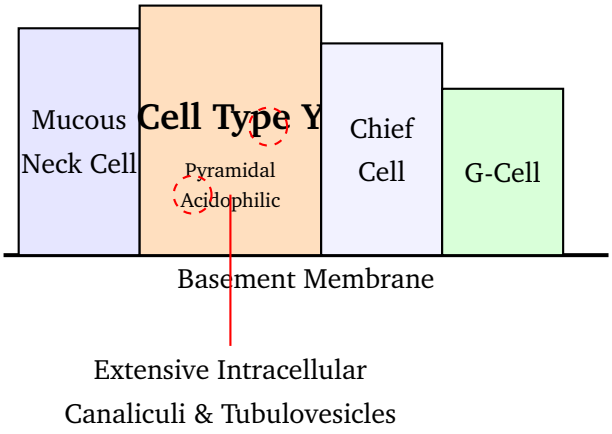
(B) Defective ventral migration of somatic mesoderm within the septum transversum

(C) Incomplete dorsal fusion of the dorsal mesentery of the esophagus

(D) Aberrant inward ingrowth of muscular components from the lateral body walls

Q6. A pathology resident examines a biopsy specimen from a normal human gastrointestinal tract segment using high-power light microscopy. The resident

focuses on a specialized epithelial zone characterized by a complex cellular mosaic. Refer to the schematic diagram below representing a gastric gland. Identify the cell type designated as **Cell Type Y**.



(A) Peptic (Chief) cells actively secreting zymogen granules

(B) Parietal (Oxyntic) cells characterized by an extensive intracellular canalicular system

(C) Enteroendocrine (A-like) cells containing electron-dense basal secretory vesicles

(D) Regenerative pluripotential stem cells localized to the mucosal isthmus region

Q7. A 44-year-old female undergoes a total thyroidectomy for a rapidly expanding follicular neoplasm. During the ligation of the inferior thyroid artery near the lower pole of the left thyroid lobe, the surgeon fails to meticulously isolate the recurrent laryngeal nerve. Postoperatively, the patient displays a persistent hoarseness of voice. What specific neuro-anatomical relationship explains this risk, and which intrinsic laryngeal muscle remains completely unaffected by this structural injury?

(A) The nerve passes anterior to the artery; Cricothyroid muscle

(B) The nerve intertwines with the branches of the artery; Cricothyroid muscle

(C) The nerve runs deep to the pretracheal fascia; Posterior cricoarytenoid muscle

(D) The nerve runs lateral to the suspensory ligament of Berry; Thyroarytenoid muscle

Q8. A patient presents with complete unilateral loss of taste sensation from the anterior two-thirds of the tongue, along with an absent ipsilateral lacrimation response when exposed to an irritant, but with intact general somatic sensation across the same lingual territory. A targeted central lesion must be localized. Which specific neuroanatomical structure or site is the most likely source of this combined tract deficit?

(A) Distal segment of the lingual nerve within the submandibular space

(B) Intracanalicular segment of the facial nerve proximal to the geniculate ganglion

(C) Chorda tympani nerve crossing the tympanic membrane in the middle ear cleft

(D) Proximal segment of the mandibular division of the trigeminal nerve at the foramen ovale

Q9. During a deep transoral surgical entry into the parapharyngeal space to manage an encapsulated pleomorphic adenoma of the deep lobe of the parotid gland, the surgeon requires strict visualization of the structural contents running between the styloid process and the digastric muscle. Which structural configuration accurately identifies the sequence of major vascular elements encountered from superficial to deep within this specific anatomical surgical corridor?

(A) Internal jugular vein → Internal carotid artery → External carotid artery

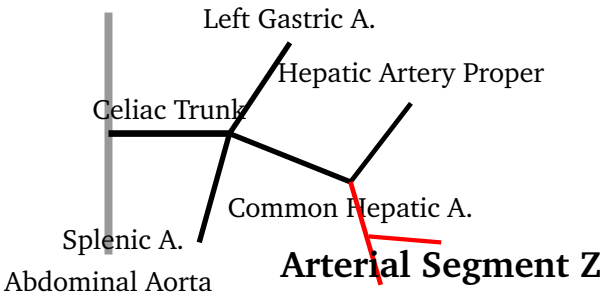
(B) External carotid artery → Internal carotid artery → Internal jugular vein

(C) Internal carotid artery → External carotid artery → Internal jugular vein

(D) External carotid artery → Internal jugular vein → Internal carotid artery

Q10. An interventional radiologist performs a selective catheterization of the celiac trunk to control a massive upper gastrointestinal hemorrhage from a deep penetrating duodenal ulcer. The angiogram demonstrates a highly

complex branch architecture. Study the arterial tree schematic diagram shown below. Identify the specific vessel marked as **Arterial Segment Z**, which is responsible for supplying the specific sub-segmental territory across the pyloroduodenal junction line:



(A) Right Gastric Artery

(B) Gastroduodenal Artery

(C) Superior Pancreaticoduodenal Artery

(D) Right Gastroepiploic Artery

Q11. A 53-year-old male presents with signs of high intracranial pressure and selective neuro-ophthalmic deficits. Detailed formal visual field perimetry confirms the presence of a distinct, complete left homonymous superior quadrantanopia ("pie in the sky" defect). A highly localized intracranial space-occupying lesion is suspected. Which structural segment of the central visual pathway is affected by this focal lesion?

(A) Medial fibers of the right optic radiation passing through the parietal lobe

(B) Lateral fibers of the right optic radiation looping around the temporal horn of the lateral ventricle (Meyer's loop)

(C) Lower lip of the right calcarine sulcus cortex (lingual gyrus segment)

(D) Upper lip of the right calcarine sulcus cortex (cuneus segment)

Q12. An ultramicroscopic structural analysis of the human splenic parenchymal filtration barrier focuses on the complex spatial arrangement within the red pulp zone. The investigators examine the structural configuration of

the venous sinusoids and their basement membranes. Which structural description accurately describes the morphology of the endothelial cells lining these sinusoids and the specific orientation of their associated extracellular reticular fiber support meshwork?

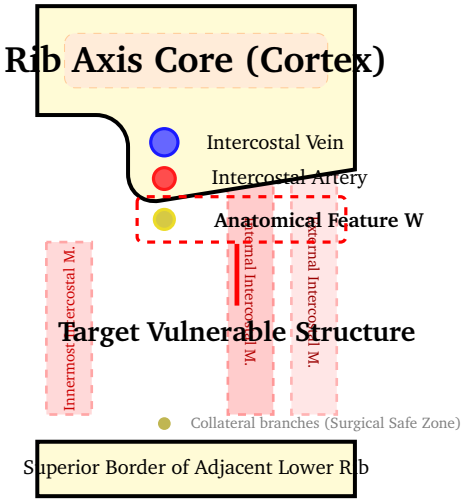
(A) Short, polygonal endothelial cells with tight junctions; supported by a continuous dense basement membrane

(B) Elongated, spindle-shaped endothelial cells running parallel to the long axis; supported by transverse, ring-like (hoop-like) arrangements of reticular fibers

(C) Fenestrated cuboidal cells with intercellular pores; supported by a longitudinal framework of thick collagenous bands

(D) Overlapping squamous cells with a shifting basal lamina; supported by an amorphous matrix devoid of any structured fibrillar networks

Q13. A 29-year-old male sustains a penetrating knife wound to the left mid-axillary line at the level of the 8th intercostal space. Emergency thoracoscopy reveals a laceration of the diaphragmatic pleura along with active hemorrhage from a neurovascular bundle running along the costal margin. Review the structural cross-section of the intercostal space margin displayed below. Identify the structural element labeled as **Anatomical Feature W**, which is highly vulnerable to injury if instruments are placed incorrectly along this margin:



(A) Collateral intercostal nerve branch running along the upper border of the lower rib

(B) Main trunk of the intercostal nerve running directly within the costal groove inferior to the main vessels

(C) Lateral cutaneous branch of the intercostal nerve piercing the internal intercostal muscle

(D) Endothoracic fascial specialized lymphatic trunk tracking the posterior intercostal course

Q14. A clinical geneticist evaluates an infant presenting with severe micrognathia, low-set malformed ears, a cleft palate, and a severe cardiovascular anomaly involving a persistent truncus arteriosus. Fluorescence in situ hybridization (FISH) confirms a 22q11.2 microdeletion (DiGeorge syndrome). This systemic presentation reflects a severe dysmorphogenesis involving cells derived from which specific embryonic source, and which pharyngeal pouches are primarily malformed?

(A) Cranial neural crest cells; Third and fourth pharyngeal pouches

(B) Paraxial mesoderm segments; First and second pharyngeal pouches

(C) Lateral plate splanchnic mesoderm; Second and third pharyngeal pouches

(D) Surface ectoderm placodes; Fourth and fifth pharyngeal pouches

Q15. A 67-year-old male is diagnosed with a deep carcinoma infiltrating the base of his tongue and the tonsillar fossa wall. During a radical neck dissection to clear the regional deep cervical lymph nodes, the surgeon needs to preserve the nerve that provides both general somatic sensation and special gustatory taste transduction to the posterior one-third of the tongue. Which cranial nerve must be isolated, and through which cranial base osseous opening does it exit the skull?

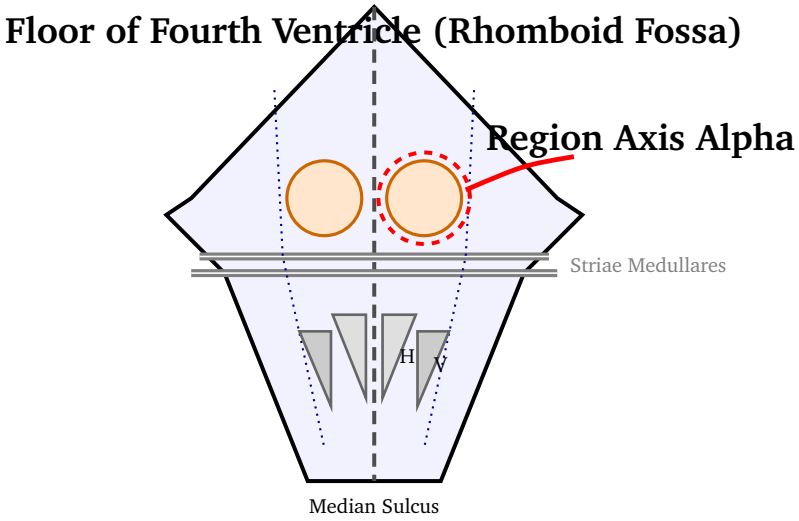
(A) Cranial Nerve VII; Stylomastoid foramen

(B) Cranial Nerve IX; Jugular foramen

(C) Cranial Nerve X; Jugular foramen

(D) Cranial Nerve V (Lingual branch); Foramen ovale

Q16. An advanced neuro-navigation procedure is underway to extract an intraventricular ependymoma from the floor of the fourth ventricle. The neurosurgeon maps the structural landmarks to avoid damaging the underlying cranial nerve motor nuclei. Examine the highly structured brainstem schematic diagram below. Identify the structural feature indicated by the bold arrow pointing to **Region Axis Alpha**:



(A) Hypoglossal trigone containing the specialized somatic motor neurons of CN XII

(B) Vagal trigone containing the dorsal motor nucleus of the vagus nerve (CN X)

(C) Facial colliculus formed by facial nerve fibers looping around the abducens nucleus

(D) Vestibular area overlying the complex collection of vestibular nuclear structures

Q17. A 35-year-old multi-parous female presents with an exquisite, deep-seated throbbing groin pain. Clinical evaluation confirms a strangulated femoral hernia containing an ischemic loop of the ileum. To execute an emergency reduction, the surgeon must make an incisional release along the rigid margin of the femoral ring. Which structural tissue boundary represents the medial margin of this ring that is highly vulnerable to variant arterial hemorrhage (aberrant obturator artery/'corona mortis') during this step?

(A) Femoral vein wall sheath

(B) Lacunar (Gimbernat's) ligament

(C) Pectineal (Cooper's) ligament

(D) Inguinal (Poupart's) ligament

Detailed Solutions

Q1.

Solution

Concept: The lower third of the esophagus receives its arterial blood supply predominantly from the esophageal branches of the left gastric artery, which is supplemented by collateral paths from the left inferior phrenic artery. In standard anatomy, the left inferior phrenic artery originates directly from the celiac trunk or the abdominal aorta and ascends along the crus of the diaphragm, giving off small esophageal twigs.

Solution:

Let's evaluate the anatomy and variants relevant to the surgical complication:

(a) The surgeon placed a vascular clip across a small collateral channel running directly along the anterior surface of the diaphragmatic crus.

(b) This vessel corresponds to the **left inferior phrenic artery**. It is highly variable in its origin, frequently arising as a variant branch directly from the celiac trunk or the aorta.

(c) Because the patient developed profound ischemic changes restricted exclusively to the lower third of the esophagus, this variant pathway was acting as a critical, non-redundant arterial supply to that specific esophageal segment.

Final Answer: Variant left inferior phrenic artery arising directly from the celiac trunk

Answer: (A)

Go Back to Question 1

Q2.

Solution

Concept: The clinical presentation describes **Wallenberg syndrome** (Lateral Medullary Syndrome). This syndrome results from an ischemic infarction localized strictly within the dorsolateral territory of the medulla oblongata, which compromises the nucleus ambiguus, spinothalamic tract, spinal trigeminal nucleus, and descending sympathetic fibers.

Solution:

Let's identify the vascular lesion responsible for this presentation:

(a) The classic vascular source responsible for lateral medullary infarction is the **posterior inferior cerebellar artery (PICA)** or its parent vertebral artery.

(b) In this patient, a microvascular angiogram revealed a highly isolated structural variant limited strictly to the **isolated thrombotic occlusion of the PICA lateral medullary branch**.

(c) This specific branch supplies the dorsolateral medullary quadrant, accounting for the cross-segregated sensory deficits (ipsilateral face, contralateral body) along with dysphagia and dysarthria.

Final Answer: Isolated thrombotic occlusion of the posterior inferior cerebellar artery (PICA) lateral medullary branch

Answer: (B)

Go Back to Question 2

Q3.

Solution

Concept: The infratemporal fossa is a deep, complex anatomical space located inferior to the zygomatic arch and deep to the ramus of the mandible. Within the upper portion of this space, the **chorda tympani nerve** (a branch of $CN\ VII$) exits the petrotympanic fissure and enters the infratemporal fossa, where it descends obliquely to merge with the **lingual nerve** (a branch of V_3).

Solution:

Let's analyze the contents of the highlighted structural layer (**Zone X**):

(a) The diagram depicts a schematic layout of the infratemporal fossa bounded by the lateral pterygoid plate medially and the mandibular ramus laterally. It also maps out the superficial contents, including the maxillary artery and the pterygoid venous plexus.

(b) **Zone X** lies deep to these vascular elements, representing the deep neurovascular plane located between the medial and lateral pterygoid muscles (the interpterygoid space).

(c) Within this deep nerve layer, the **chorda tympani nerve merges with the lingual nerve** in the upper part of the space. This makes option B the correct structural nexus located precisely inside this target zone.

Final Answer: Chorda tympani nerve merging with the lingual nerve in the upper interpterygoid space

Answer: (B)

Go Back to Question 3

Q4.

Solution

Concept: The vascular supply to the femoral head changes significantly from childhood to adult life. In adults, the majority of the blood supply to the head of the femur is provided by an extracapsular arterial ring that gives off ascending cervical branches, also known as **retinacular arteries**.

Solution:

Let's analyze the terminal sources supplying the adult femoral head:

(a) The extracapsular arterial ring is formed primarily by the **medial femoral circumflex artery (MFCA)** posteriorly and the lateral femoral circumflex artery anteriorly.

(b) The **medial femoral circumflex artery** contributes the predominant share of this perfusion via its superior and lateral retinacular (ascending cervical) branches.

(c) These branches pierce the joint capsule and track proximally along the femoral neck to supply the femoral head. Preserving these vessels during a posterior Kocher-Langenbeck approach is vital to avoid avascular necrosis. The foveolar artery within the ligamentum teres is typically negligible or patent in only a fraction of adults.

Final Answer: Ascending cervical branches (retinacular arteries) arising from the medial femoral circumflex artery

Answer: (B)

Go Back to Question 4

Q5.

Solution

Concept: The definitive diaphragm develops from the fusion of four embryonic components: the septum transversum, the dorsal mesentery of the esophagus, the muscular ingrowth from the lateral body walls, and the **pleuroperitoneal membranes**.

Solution:

Let's identify the specific component responsible for a left posterolateral diaphragmatic hernia:

(a) The clinical description outlines a classic **Bochdalek hernia**, which is the most common type of congenital diaphragmatic hernia and occurs overwhelmingly (85%) on the left posterolateral side.

(b) This specific location corresponds directly to the position of the embryonic **pleuroperitoneal canal**.

(c) A structural failure in the closure, fusion, or muscularization of the **pleuroperitoneal membranes** with the other diaphragmatic elements leaves a patent defect through which abdominal viscera (stomach, intestines) herniate into the thoracic cavity.

Final Answer: Pleuroperitoneal membranes failing to close the pleuroperitoneal canals

Answer: (A)

Go Back to Question 5

Q6.

Solution

Concept: The gastric glands situated within the fundus and body of the stomach possess a highly specialized cell population. Cells that are pyramidal or pear-shaped, intensely acidophilic (eosinophilic), and located primarily in the neck and upper body segments of the gland are **parietal (oxyntic) cells**.

Solution:

Let's analyze the histological features of **Cell Type Y**:

(a) The schematic explicitly highlights that **Cell Type Y** contains an **extensive intracellular canalicular system** and a dense network of tubulovesicles.

(b) These specialized intracellular canaliculi are unique morphological traits of **parietal cells**, providing a massive surface area lined with H^+/K^+ ATPase proton pumps to actively secrete hydrochloric acid (HCl) and intrinsic factor.

(c) Their acidophilic nature under light microscopy is due to the presence of an exceptionally high density of mitochondria required to power this active transport.

Final Answer: Parietal (Oxyntic) cells characterized by an extensive intracellular canalicular system

Answer: (B)

Go Back to Question 6

Q7.

Solution

Concept: The **recurrent laryngeal nerve** (*RLN*) regulates the motor drive to almost all the intrinsic muscles of the larynx. During a thyroidectomy, it is at high risk near the lower pole of the gland due to its intimate and variable relationship with the **inferior thyroid artery**.

Solution:

Let's evaluate the structural relationships and muscular innervation described:

(a) Near the lower pole of the thyroid, the recurrent laryngeal nerve passes anterior, posterior, or **intertwines with the branches of the inferior thyroid artery**. Because of this unpredictable arrangement, the artery must be ligated well lateral to the gland.

(b) If the RLN is injured, it causes paralysis of the ipsilateral intrinsic muscles, leading to persistent hoarseness.

(c) The only intrinsic laryngeal muscle that remains **completely unaffected** by an RLN injury is the **cricothyroid muscle**. This is because the cricothyroid muscle is uniquely innervated by the **external laryngeal nerve** (a branch of the superior laryngeal nerve).

Final Answer: The nerve intertwines with the branches of the artery; Cricothyroid muscle

Answer: (B)

Go Back to Question 7

Q8.

Solution

Concept: The facial nerve ($CN\ VII$) carries special visceral afferent (taste) fibers from the anterior two-thirds of the tongue and parasympathetic secretomotor preganglionic fibers to the lacrimal gland via the greater petrosal nerve.

Solution:

Let's localize the site of the lesion based on the combination of deficits:

(a) General somatic sensation across the anterior two-thirds of the tongue is carried by the lingual nerve (a branch of V_3) and is completely intact, ruling out a primary trigeminal or distal lingual nerve lesion.

(b) The loss of taste from the anterior tongue indicates a lesion affecting the chorda tympani path. However, the patient *also* exhibits a loss of the lacrimation response.

(c) The secretomotor fibers for lacrimation leave the facial nerve at the geniculate ganglion via the greater petrosal nerve.

(d) Therefore, a lesion must be located proximal to the takeoff of the greater petrosal nerve. This isolates the defect to the **intracanalicular segment of the facial nerve proximal to the geniculate ganglion** within the internal acoustic meatus.

Final Answer: Intracanalicular segment of the facial nerve proximal to the geniculate ganglion

Answer: (B)

Go Back to Question 8

Q9.

Solution

Concept: The parapharyngeal space contains critical neurovascular structures. When accessing this space via a deep surgical corridor between the styloid process and the posterior belly of the digastric muscle, the major vascular elements exhibit a strict, layered sequence from superficial to deep.

Solution:

Let's trace the vessels from the lateral (superficial) aspect to the medial (deep) aspect:

(a) The most superficial of the large vessels in this immediate retrostyloid region is the **external carotid artery (ECA)** as it ascends toward or through the parotid gland substance.

(b) Deep to the external carotid artery and separated from it by the styloid muscles lies the **internal carotid artery (ICA)**.

(c) The **internal jugular vein (IJV)** is situated in the most lateral/posterior compartment of the carotid sheath, placing it in the deepest position relative to this anterior/transoral trans-styloid surgical entry vector.

(d) Thus, the correct sequence encountered from superficial to deep is External carotid artery → Internal carotid artery → Internal jugular vein.

Final Answer: External carotid artery → Internal carotid artery → Internal jugular vein

Answer: (B)

Go Back to Question 9

Q10.

Solution

Concept: The celiac trunk branches into the left gastric, splenic, and common hepatic arteries. The common hepatic artery then divides into the hepatic artery proper and the **gastroduodenal artery (GDA)**.

Solution:

Let's identify the highlighted branch (**Arterial Segment Z**) from the schematic:

(a) The schematic shows the celiac trunk bifurcating/trifurcating. The inferior branch heading toward the pyloroduodenal area is the common hepatic artery.

(b) The common hepatic artery gives off a major branch that descends vertically behind the first part of the duodenum. This is the **gastroduodenal artery**, marked as **Arterial Segment Z**.

(c) The GDA runs in close proximity to the posterior wall of the duodenal bulb, making it the primary vessel eroded by a deep penetrating posterior duodenal ulcer, which results in massive upper gastrointestinal hemorrhage.

Final Answer: Gastroduodenal Artery

Answer: (B)

Go Back to Question 10

Q11.

Solution

Concept: A complete left homonymous superior quadrantanopia is clinically known as a **"pie in the sky"** defect. This visual field loss is caused by a lesion disrupting the ventral pathways of the optic radiation on the opposite (right) side of the brain.

Solution:

Let's trace the specific fiber pathway within the right optic radiation:

(a) The visual pathways conveying information from the superior quadrants of the contralateral visual field travel within the inferior/lateral loop of the optic radiation.

(b) These fibers travel forward and loop around the temporal horn of the lateral ventricle within the temporal lobe, a pathway known anatomically as **Meyer's loop**.

(c) A focal lesion in the right temporal lobe involving **Meyer's loop** interrupts these specific ventral fibers, culminating in a complete left homonymous superior quadrantanopia.

Final Answer: Lateral fibers of the right optic radiation looping around the temporal horn of the lateral ventricle (Meyer's loop)

Answer: (B)

Go Back to Question 11

Q12.

Solution

Concept: The red pulp of the spleen contains unique venous sinusoids designed to filter aged or damaged erythrocytes. The structural architecture of these sinusoids is optimized for mechanical blood filtration.

Solution:

Let's evaluate the specialized morphology of the splenic sinusoid wall:

(a) The endothelial cells lining the splenic sinusoids are highly **elongated, spindle-shaped cells** (often compared to wooden staves of a barrel) that run parallel to the long axis of the vessel.

(b) These cells lack typical continuous tight junctions, leaving narrow intercellular slits through which healthy red blood cells must deform to re-enter circulation.

(c) This endothelial wall is supported externally by an incomplete basement membrane composed of reticular fibers arranged in a **transverse, ring-like (hoop-like)** fashion. This barrel-like architecture provides structural support while allowing filtration through the slits.

Final Answer: Elongated, spindle-shaped endothelial cells running parallel to the long axis; supported by transverse, ring-like (hoop-like) arrangements of reticular fibers

Answer: (B)

Go Back to Question 12

Q13.

Solution

Concept: The intercostal neurovascular bundle tracks along the inferior margin of each rib within the costal groove. The structural arrangement of elements within this bundle follows a predictable superior-to-inferior sequence: **Vein, Artery, Nerve (V-A-N)**.

Solution:

Let's identify the targeted element (**Anatomical Feature W**) and its vulnerability:

(a) Within the costal groove, the intercostal vein is positioned highest, followed by the intercostal artery in the middle.

(b) The **intercostal nerve** occupies the lowest position in the triad, making it the structure that extends furthest inferiorly, often past the protective shelter of the costal groove lip.

(c) **Anatomical Feature W** is the **main trunk of the intercostal nerve**. Because it is the lowest and least protected element of the bundle, it is highly vulnerable to accidental trauma or compression when needles or thoracostomy tubes are introduced along the lower margin of a rib.

Final Answer: Main trunk of the intercostal nerve running directly within the costal groove inferior to the main vessels

Answer: (B)

Go Back to Question 13

Q14.

Solution

Concept: DiGeorge syndrome (22q11.2 microdeletion) causes a severe defect in the development of the pharyngeal arches and pouches. The syndrome is characterized by thymic hypoplasia, hypocalcemia (parathyroid hypoplasia), micrognathia, and outflow tract cardiac anomalies like persistent truncus arteriosus.

Solution:

Let's isolate the embryonic cell population and pouches affected:

(a) The primary cellular drivers of pharyngeal arch development and cardiac outflow tract septation are **cranial neural crest cells**.

(b) In DiGeorge syndrome, a microdeletion disrupts neural crest cell migration and differentiation within the pharyngeal apparatus.

(c) The thymus and inferior parathyroid glands develop from the **third pharyngeal pouch**, while the superior parathyroid glands develop from the **fourth pharyngeal pouch**. The failure of these specific pouches to differentiate properly accounts for the immune and calcium regulation deficits seen in these infants.

Final Answer: Cranial neural crest cells; Third and fourth pharyngeal pouches

Answer: (A)

Go Back to Question 14

Q15.

Solution

Concept: The posterior one-third of the tongue has a distinct innervation pattern where both **general somatic sensation** (touch, temperature) and **special visceral afferent sensation** (taste) are mediated by a single nerve trunk: the **glossopharyngeal nerve ($CN\ IX$)**.

Solution:

Let's identify the nerve and its corresponding cranial base exit point:

(a) While the anterior two-thirds of the tongue has split innervation (lingual nerve for touch, chorda tympani for taste), the posterior one-third is supplied entirely by **CN IX**.

(b) The glossopharyngeal nerve exits the posterior cranial fossa by passing through the **jugular foramen**, accompanied by the vagus nerve ($CN\ X$), the accessory nerve ($CN\ XI$), and the internal jugular vein.

(c) Therefore, to preserve taste and touch to the posterior tongue during a radical neck dissection, the surgeon must carefully isolate CN IX near its exit at the jugular foramen.

Final Answer: Cranial Nerve IX; Jugular foramen

Answer: (B)

Go Back to Question 15

Q16.

Solution

Concept: The floor of the fourth ventricle (rhomboid fossa) contains key structural landmarks that overlie the motor nuclei of various cranial nerves. In the upper (pontine) half of the fossa, a distinct prominence is situated adjacent to the midline median sulcus.

Solution:

Let's identify the landmark labeled **Region Axis Alpha**:

(a) The arrow points to a rounded elevation in the pontine part of the rhomboid fossa floor, which is the **facial colliculus**.

(b) The facial colliculus is formed by the axons of the **facial nerve ($CN\ VII$)** looping dorsally around the motor nucleus of the **abducens nerve ($CN\ VI$)** before exiting the brainstem.

(c) Surgical trauma to **Region Axis Alpha** during the resection of an intraventricular tumor can cause simultaneous ipsilateral facial paralysis and lateral rectus palsy.

Final Answer: Facial colliculus formed by facial nerve fibers looping around the abducens nucleus

Answer: (C)

Go Back to Question 16

Q17.

Solution

Concept: The femoral ring is the rigid abdominal opening of the femoral canal. It is a common site for strangulated femoral hernias, which require surgical release of its margins to reduce the ischemic loop of bowel.

Solution:

Let's define the structural boundaries of the femoral ring to find the medial margin:

(a) **Lateral boundary:** Formed by the femoral vein wall within the femoral sheath.

(b) **Anterior boundary:** Formed by the inguinal ligament.

(c) **Posterior boundary:** Formed by the pectineal (Cooper's) ligament.

(d) **Medial boundary:** Formed by the crescentic edge of the **lacunar (Gimbernat's) ligament**.

(e) To enlarge the ring during emergency surgery, the surgeon incises the medial edge—the lacunar ligament. This step carries a high risk of severe hemorrhage if the patient possesses an aberrant obturator artery arising from the inferior epigastric artery, a vascular variant known as the **corona mortis** (crown of death) that arches directly over this ligament.

Final Answer: Lacunar (Gimbernat's) ligament

Answer: (B)

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Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	B	3	B	4	B	5	A
6	B	7	B	8	B	9	B	10	B
11	B	12	B	13	B	14	A	15	B
16	C	17	B						