NEET PG Anatomy Sample Paper-4

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. A 42-year-old male is brought to the emergency department following a high-speed motor vehicle collision. He exhibits a posterior dislocation of the right hip joint. On physical examination, the patient is unable to dorsiflex his right foot or evert the foot, and there is an absolute loss of sensation on the dorsum of the foot and the anterolateral aspect of the leg. Damage to which structural subdivision of the sciatic nerve trunk within the infrapiriform space explains these acute deficits?

(A) Tibial division of the sciatic nerve

(B) Common fibular (peroneal) division of the sciatic nerve

(C) Nerve to the quadratus femoris muscle

(D) Posterior femoral cutaneous nerve

Q2. During a difficult open radical pancreatectomy for an invasive adenocarcinoma of the pancreatic head, a surgical oncology fellow encounters sudden, massive venous hemorrhage deep within the upper border of the pancreatic neck. The bleeding occurs immediately behind the neck of the pancreas where two major vessels join to initiate a massive vascular trunk. Which specific venous confluence is located directly posterior to the neck of the pancreas?

(A) Confluence of the inferior vena cava and renal veins

(B) Junction of the superior mesenteric vein and splenic vein to form the portal vein

(C) Confluence of the left gastric vein and splenic vein

(D) Insertion of the inferior mesenteric vein into the superior mesenteric vein

Q3. A 63-year-old female presents with severe pain along the medial aspect of her right thigh that radiates down to the knee. The pain is noticeably exacerbated by extension and abduction of the hip joint. A high-resolution pelvic MRI demonstrates an occult pelvic mass herniating through a narrow anatomical canal bounded superiorly by the pubic pectineal line and inferiorly by the upper margin of the obturator membrane. Which neurovascular bundle is directly compromised by this specific herniation path?

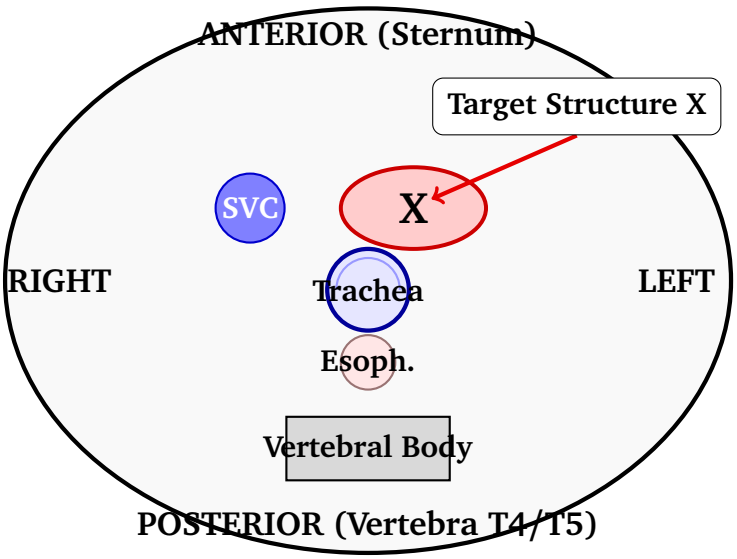
(A) Femoral nerve, artery, and vein

(B) Obturator nerve, artery, and vein

(C) Pudendal nerve and internal pudendal vessels

(D) Superior gluteal neurovascular bundle

Q4. A thoracic surgical team reviews a high-resolution axial cross-sectional schematic at the level of the T4/T5 vertebral boundary (sternal angle of Louis) to map a safe approach for a tumor resection. Identify the specific targeted vascular structure indicated by the shaded central ellipse labeled **X** positioned directly anterior to the trachea and to the left of the superior vena cava outline:



(A) Pulmonary trunk bifurcation

(B) Left brachiocephalic vein

(C) Arch of the aorta

(D) Left pulmonary artery

Q5. A 55-year-old male with long-standing portal hypertension presents with severe hematemesis. Upper GI endoscopy reveals bleeding esophageal varices. Anatomical analysis indicates that these varices form due to pathological collateral flow via a venous anastomosis connecting the systemic venous system with the portal venous system. Which specific vessels anastomose at this site?

(A) Superior rectal vein and inferior rectal veins

(B) Left gastric vein and esophageal tributaries of the azygous vein

(C) Paraumbilical veins and superficial epigastric veins

(D) Left colic vein and lumbar veins

Q6. A 29-year-old postpartum female develops a deep pelvic abscess following an instrumental delivery. The abscess tracks directly into the ischioanal (ischiorectal) fossa. During surgical drainage of this space, the surgeon must be exceedingly careful to avoid damaging the neurovascular elements running within the pudendal (Alcock's) canal. Along which structural boundary wall of the ischioanal fossa is this canal embedded?

(A) Medial wall, formed by the levator ani muscle

(B) Lateral wall, formed by the obturator internus fascia

(C) Posterior wall, formed by the gluteus maximus muscle

(D) Anterior wall, formed by the perineal membrane

Q7. A 68-year-old male presents with sudden onset of complete right-sided hemiplegia of the upper and lower limbs, accompanied by deviation of the tongue to the left side when protruded. He also exhibits a complete loss of contralateral fine touch, conscious proprioception, and vibratory sensation. An MRI demonstrates an acute ischemic infarction localized to the paramedian region of the medulla oblongata. Which specific vascular channel has undergone acute thrombotic occlusion?

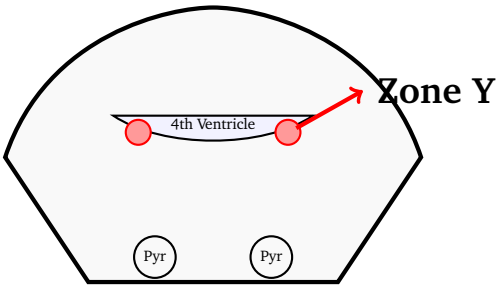
(A) Posterior inferior cerebellar artery (PICA)

(B) Anterior spinal artery

(C) Anterior inferior cerebellar artery (AICA)

(D) Posterior cerebral artery

Q8. A pathology resident examines a transverse histological slide of the lower brainstem profile. The resident focuses on a specialized area within the floor of the fourth ventricle labeled **Zone Y** in the schematic illustration below. Damage or toxic inhibition of this precise circumventricular organ triggers uncoordinated, intractable projectile emesis. Identify the structure:



(A) Locus coeruleus

(B) Area postrema

(C) Interpeduncular nucleus

(D) Median eminence

Q9. A 52-year-old female presents with progressive, severe bitemporal hemianopsia, accompanied by signs of mild hyperprolactinemia. A contrast-enhanced cranial MRI reveals a large, lobulated pituitary macroadenoma extending superiorly out of the sella turcica. Which exact anatomical structure is being compressed superiorly to generate the characteristic visual field cuts observed in this patient?

(A) Optic tract

(B) Optic chiasm

(C) Lateral geniculate nucleus

(D) Calcarine sulcus

Q10. An 18-year-old male is brought to the hospital following an assault. Neurological examination reveals a complete loss of pain and temperature sensation on the left side of his body starting from the T10 dermatomal level downwards. Concurrently, he exhibits spastic paralysis, hyperreflexia, a positive Babinski sign, and a total loss of vibratory and position sense on the right side of his body below the same level. Which spinal cord injury pattern accounts for this presentation?

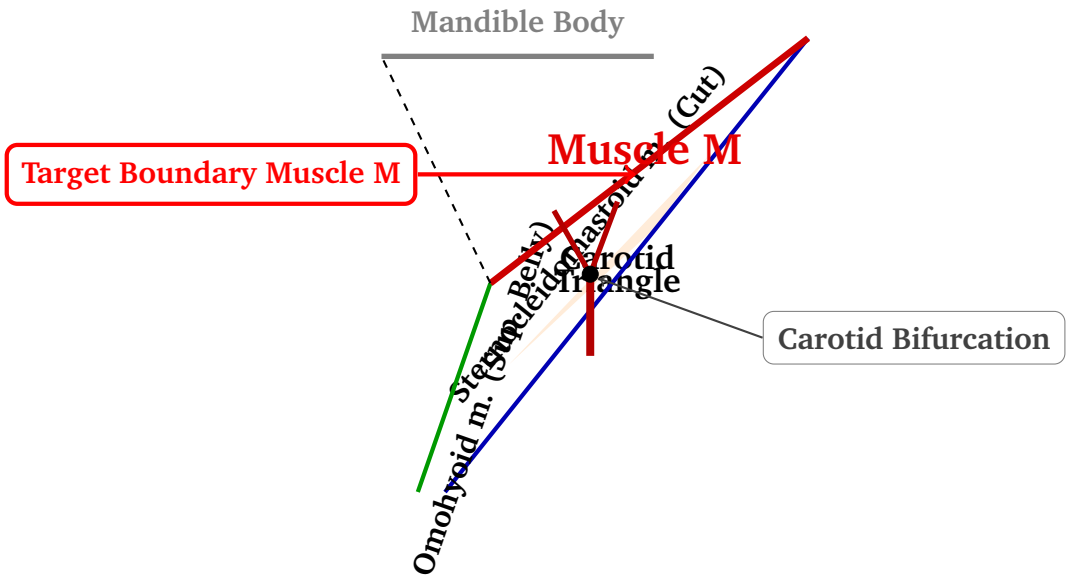
(A) Central cord syndrome secondary to syringomyelia

(B) Complete transection of the spinal cord at T10

(C) Brown-Séquard syndrome (hemisection) involving the right half of the spinal cord

(D) Anterior spinal artery syndrome involving the T10 cord segment

Q11. A surgical resident prepares to isolate and perform an emergent ligation of the external carotid artery branches to stem a massive oropharyngeal hemorrhage. The resident relies on the structural configuration of the carotid triangle mapped below. Identify the muscle landmark labeled **Muscle M** that forms the critical anterosuperior boundary of this space:



(A) Superior belly of the omohyoid muscle

(B) Posterior belly of the digastric muscle

(C) Inferior constrictor muscle

(D) Stylohyoid muscle

Q12. A 35-year-old female undergoes a total thyroidectomy for a multinodular goiter. Twenty-four hours post-surgery, she complains of a persistent, severe hoarseness of voice. Laryngoscopic examination reveals that her right vocal cord is fixed in an adducted position due to unilateral vocal fold paralysis. Which specific nerve, running in close structural proximity to the inferior thyroid artery, was most likely severed during the surgical procedure?

(A) Internal branch of the superior laryngeal nerve

(B) External branch of the superior laryngeal nerve

(C) Recurrent laryngeal nerve

(D) Ansa cervicalis

Q13. A 47-year-old male presents with an aggressive malignant tumor localized within the pterygopalatine fossa. Biopsy confirms perineural invasion. The managing oncologist is concerned about the retrograde intracranial spread of the tumor into the middle cranial fossa via the primary posterior opening

of this anatomical space. Through which canal or foramen will the tumor cells travel to directly enter the middle cranial fossa?

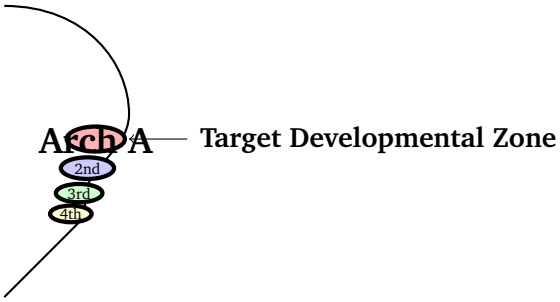
(A) Foramen rotundum

(B) Sphenopalatine foramen

(C) Pterygoid (Vidian) canal

(D) Inferior orbital fissure

Q14. A newborn infant presenting with micrognathia, low-set ears, cleft palate, and a severe low-set mandate sequence is suspected of having a congenital neurocristopathy. The developmental anomalies are traced directly back to abnormal neural crest cell migration into the primitive pharyngeal arch structures outlined below. Identify the structural destination labeled **Arch A** in the schematic diagram that normally develops into the malleus, incus, and Meckel's cartilage matrix:



(A) First Pharyngeal Arch (Mandibular Arch)

(B) Second Pharyngeal Arch (Hyoid Arch)

(C) Third Pharyngeal Arch

(D) Fourth Pharyngeal Arch

Q15. A pediatric cardiologist diagnoses a 2-week-old neonate with a rare, severe congenital cardiac malformation characterized by a total failure of spiral septum development within the bulbus cordis and truncus arteriosus. This failure completely prevents the normal division of the primitive outflow tract into the aorta and pulmonary trunk. Which embryological condition matches this specific mechanical description?

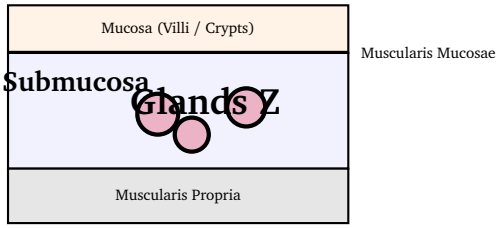
(A) Tetralogy of Fallot

(B) Persistent Truncus Arteriosus

(C) Transposition of the Great Vessels

(D) Atrial Septal Defect (Osteum Secundum type)

Q16. A pathology resident examines a high-power microscopic cross-section of an unknown segment of the human gastrointestinal tract. The resident maps out the structural layers in the vector diagram shown below. The defining histological feature is the dense presence of specialized, heavily branched mucus-secreting alkaline glands labeled **Glands Z** localized entirely within the submucosal layer, deep to the muscularis mucosae. Identify this specific anatomical organ segment:



(A) Fundus of the Stomach

(B) Jejunum

(C) Duodenum (Brunner's Glands)

(D) Ileum (Peyer's Patches)

Q17. A medical student examines an unknown tissue slide under a light microscope. The section displays a clear, highly cellular parenchymal organization with cords of polygonal cells arranged radially around a large central vein. Interspersed between these cellular plates are wide, fenestrated endothelial-lined sinusoids containing specialized stellate phagocytic cells (Kupffer cells). Which structural organ corresponds to this description?

(A) Spleen

(B) Liver

(C) Lymph Node

(D) Adrenal Cortex

Detailed Solutions

Q1.

Solution

Concept: The sciatic nerve trunk ($L4-S3$) exits the pelvis via the greater sciatic foramen, specifically passing through the infrapiriform space. It consists of two distinct structural subdivisions enclosed within a common epineurial sheath: the **medial tibial division** and the **lateral common fibular (peroneal) division**. Due to its lateral position and relative fixation over the posterior aspect of the hip joint, the common fibular division is uniquely susceptible to traction or compression injury during a posterior hip dislocation.

Solution:

Let's analyze the clinical presentation to identify the damaged component:

(a) **Motor deficits:** The patient cannot dorsiflex the foot (loss of the deep fibular nerve innervating the anterior compartment muscles) or evert the foot (loss of the superficial fibular nerve innervating the lateral compartment muscles). This combination presents clinically as foot drop.

(b) **Sensory deficits:** The complete loss of cutaneous sensation across the dorsum of the foot and the anterolateral aspect of the leg corresponds precisely to the cutaneous territories supplied by the superficial and deep branches of the common fibular nerve.

(c) **Differential diagnosis:** The tibial division supplies the muscles of the posterior compartment of the leg (plantarflexion/inversion) and the sensation to the plantar surface of the foot, which are intact here. Thus, the lesion is isolated to the common fibular subdivision.

Final Answer: Common fibular (peroneal) division of the sciatic nerve

Answer: (B)

Go Back to Question 1

Q2.

Solution

Concept: The hepatic portal vein is a massive vascular trunk responsible for directing blood from the gastrointestinal tract and spleen to the liver. It forms via a specific extrahepatic venous confluence that takes place directly **posterior to the neck of the pancreas** at the level of the L2 vertebra.

Solution:

Let's trace the surgical anatomy of the peripancreatic region:

(a) The **splenic vein** runs horizontally along the posterior aspect of the pancreatic body and tail.

(b) The **superior mesenteric vein (SMV)** travels vertically upstream, draining the midgut, and passes posterior to the neck of the pancreas.

(c) Directly behind the pancreatic neck, the vertical SMV and the horizontal splenic vein unite to form the **hepatic portal vein**.

(d) During an open radical pancreatectomy, mobilizing or dividing the pancreatic neck can compromise this exact venous junction, leading to sudden, massive hemorrhage from the portal confluence.

Final Answer: Junction of the superior mesenteric vein and splenic vein to form the portal vein

Answer: (B)

Go Back to Question 2

Q3.

Solution

Concept: An obturator hernia is a rare pelvic floor hernia where abdominal or pelvic contents protrude through the narrow **obturator canal**. This rigid osseofibrous canal is located in the upper part of the obturator foramen, bounded superiorly by the pubic pectineal line (obturator groove of the pubis) and inferiorly by the upper free border of the obturator membrane.

Solution:

Let's evaluate the anatomical consequences of this herniation pathway:

(a) The obturator canal transmits the **obturator nerve, artery, and vein** from the pelvis into the medial compartment of the thigh.

(b) A herniating mass compressing the nerve within this narrow space produces the classic **Howship-Romberg sign**: pain along the medial aspect of the thigh that radiates to the knee due to irritation of the cutaneous branch of the obturator nerve.

(c) This pain is typically exacerbated by maneuvers that tension the obturator internus and externus muscles around the foramen, specifically hip extension, abduction, or medial rotation.

Final Answer: Obturator nerve, artery, and vein

Answer: (B)

Go Back to Question 3

Q4.

Solution

Concept: At the level of the T4/T5 vertebral boundary—corresponding anteriorly to the sternal angle of Louis—the superior mediastinum transitions into the inferior mediastinum. This horizontal thoracic plane crosses critical vascular structures, including the initialization and termination of the **arch of the aorta**.

Solution:

Let's analyze the spatial layout of the axial cross-section provided:

(a) **Posterior landmarks:** The vertebral body of T4 lies at the absolute posterior limit, with the esophagus positioned immediately anterior to it.

(b) **Central landmarks:** The trachea sits directly in front of the esophagus. At this exact axial plane (T4/T5), the trachea is positioned right before its bifurcation into the primary bronchi.

(c) **Anterior/Lateral landmarks:** To the right side of the chest (left side of the diagram), the circular profile represents the superior vena cava (SVC).

(d) **Structure X:** The large ellipse labeled **X** lies directly anterior to the trachea and to the left of the SVC. This represents the cross-section of the arch of the aorta as it curves obliquely backward from right to left over the pulmonary bifurcation.

Final Answer: Arch of the aorta

Answer: (C)

Go Back to Question 4

Q5.

Solution

Concept: Portal-systemic (portacaval) anastomoses are collateral channels that allow blood from the portal system to bypass an obstructed liver and enter the systemic venous system. When portal vein pressure increases pathologically (portal hypertension), these thin-walled collateral veins become engorged and dilated, forming varices.

Solution:

Let's isolate the specific vessels involved in the gastroesophageal junction anastomosis:

(a) **Portal component:** The **left gastric vein** (coronary vein) drains the lesser curvature of the stomach and the lower part of the esophagus directly into the portal vein.

(b) **Systemic component:** The **esophageal veins** from the upper and middle segments of the esophagus drain into the **azygous vein** (and hemi-azygous vein), which empties into the superior vena cava.

(c) **Pathology:** At the lower esophagus, these two systems form a submucosal network. Severe backpressure diverts portal blood into the esophageal tributaries of the azygous system, creating fragile, high-pressure esophageal varices prone to rupture and catastrophic hematemesis.

Final Answer: Left gastric vein and esophageal tributaries of the azygous vein

Answer: (B)

Go Back to Question 5

Q6.

Solution

Concept: The ischioanal (ischiorectal) fossa is a wedge-shaped, fat-filled space flanking the anal canal. It is bounded medially by the sloping levator ani and external anal sphincter muscles, and laterally by the vertical ischial tuberosity and the lower portion of the obturator internus muscle.

Solution:

Let's locate the position of the pudendal canal within this space:

(a) The **pudendal (Alcock's) canal** is a specialized split or duplication within the obturator fascia that invests the medial surface of the **obturator internus muscle**.

(b) Because the obturator internus defines the lateral boundary of the ischioanal fossa, the pudendal canal is structurally embedded along the **lateral wall** of the fossa.

(c) This canal transmits the internal pudendal vessels and the pudendal nerve. During surgical debridement or drainage of an ischioanal abscess, instruments must be directed away from this lateral fascia to avoid severe neurovascular injury (which could cause fecal/urinary incontinence or perineal anesthesia).

Final Answer: Lateral wall, formed by the obturator internus fascia

Answer: (B)

Go Back to Question 6

Q7.

Solution

Concept: Medial Medullary Syndrome (Dejerine Syndrome) is caused by an ischemic infarction of the paramedian region of the medulla oblongata. This specific territory contains three major longitudinal pathways: the pyramidal tract, the medial lemniscus, and the fibers of the hypoglossal nerve ($CN\ XII$).

Solution:

Let's match the clinical symptoms with the underlying medullary structures and vascular supply:

(a) **Contralateral Hemiplegia:** Caused by damage to the uncrossed corticospinal fibers running inside the medullary **pyramid**.

(b) **Contralateral Loss of Fine Touch/Proprioception:** Caused by damage to the **medial lemniscus**.

(c) **Ipsilateral Tongue Deviation:** Caused by damage to the exiting roots of the **hypoglossal nerve ($CN\ XII$)**, making the tongue deviate to the weak (lesioned) side when protruded.

(d) **Vascular Supply:** The paramedian region of the medulla oblongata is supplied directly by paramedian branches arising from the **anterior spinal artery** (derived from the vertebral arteries). Thrombosis of this artery produces this exact presentation.

Final Answer: Anterior spinal artery

Answer: (B)

Go Back to Question 7

Q8.

Solution

Concept: The circumventricular organs are specialized brain structures characterized by highly fenestrated capillaries that lack a normal blood-brain barrier. This allows them to sample chemical changes directly from the systemic circulation. The circumventricular organ located in the caudal floor of the fourth ventricle, at the margins of the inferior angle (the obex), is the **area postrema**.

Solution:

Let's analyze the functional and structural features of the indicated region:

(a) Look at the schematic cross-section of the open medulla: **Zone Y** marks the bilateral subependymal zones situated in the dorsal wall along the lateral margins of the fourth ventricle.

(b) Identify the physiological role: The area postrema functions as the central **chemoreceptor trigger zone (CTZ)** for emesis.

(c) It contains high concentrations of dopamine, opioid, and serotonin receptors that detect blood-borne toxins, uremic metabolites, or emetic drugs, directly initiating the coordinated projectile vomiting reflex.

Final Answer: Area postrema

Answer: (B)

Go Back to Question 8

Q9.

Solution

Concept: The pituitary gland is located within the sella turcica of the sphenoid bone, positioned directly inferior to the suprasellar cistern. Positioned immediately above the diaphragma sellae is the **optic chiasm**, where the decussation of the nasal retinal fibers takes place.

Solution:

Let's trace the mass effect of a pituitary macroadenoma:

(a) As a pituitary tumor grows larger than 10 mm (macroadenoma), it expands superiorly out of the osteofibrous fossa.

(b) The upward expansion compresses the central fibers of the overlying **optic chiasm**.

(c) The fibers crossing through the center of the chiasm originate from the **nasal retinae**, which are responsible for receiving light signals from the temporal visual fields of both eyes.

(d) Mechanical compression of these decussating fibers results in the loss of both temporal visual fields, presenting clinically as a highly predictable, symmetric **bitemporal hemianopsia**.

Final Answer: Optic chiasm

Answer: (B)

Go Back to Question 9

Q10.

Solution

Concept: Brown-Séquard syndrome results from a clean lateral hemisection of the spinal cord. It presents with a distinct, split pattern of neurological deficits below the level of the lesion due to the unique crossing patterns of the major ascending sensory and descending motor pathways.

Solution:

Let's correlate the patient's sensory and motor deficits with a hemisection at the T10 spinal level:

(a) **Ipsilateral Spastic Paralysis and Hyperreflexia:** The **corticospinal tract** has already crossed in the medullary pyramids; thus, a lesion of the right half of the spinal cord interrupts the down-going fibers supplying the right side of the body.

(b) **Ipsilateral Loss of Proprioception and Vibration:** The fibers of the **dorsal column-medial lemniscus pathway** travel upward without crossing until they reach the medulla. A right-sided cord lesion cuts these uncrossed fibers, wiping out positional sense on the right side.

(c) **Contralateral Loss of Pain and Temperature:** The **spinothalamic tract** fibers cross obliquely to the opposite side within 1-2 segments after entering the spinal cord. Therefore, a lesion on the right half of the cord cuts fibers that carry pain and temperature signals originating from the *left* side of the body.

Final Answer: Brown-Séquard syndrome (hemisection) involving the right half of the spinal cord

Answer: (C)

Go Back to Question 10

Q11.

Solution

Concept: The carotid triangle is a clinically important space in the neck through which the common carotid artery ascends and bifurcates. It is bounded posteriorly by the anterior border of the sternocleidomastoid muscle, anteroinferiorly by the superior belly of the omohyoid muscle, and anterosuperiorly by the **posterior belly of the digastric muscle**.

Solution:

Let's analyze the schematic boundaries of the carotid triangle:

(a) Observe the muscle layer running obliquely down from the top right: This represents the **sternocleidomastoid muscle**, forming the posterior boundary.

(b) Observe the lower oblique border: This represents the **superior belly of the omohyoid muscle**, defining the anteroinferior boundary.

(c) Identify **Muscle M**: This muscle originates near the mastoid process and runs down toward the hyoid bone, forming the upper roof-line or anterosuperior boundary of the triangle. This matches the position of the **posterior belly of the digastric muscle** (along with the stylohyoid muscle).

Final Answer: Posterior belly of the digastric muscle

Answer: (B)

Go Back to Question 11

Q12.

Solution

Concept: The nerves innervating the laryngeal musculature are branches of the vagus nerve ($CN\ X$). The **recurrent laryngeal nerve** provides motor innervation to all intrinsic muscles of the larynx except the cricothyroid muscle. Anatomically, it ascends in the tracheoesophageal groove, passing in close proximity to the branches of the **inferior thyroid artery**.

Solution:

Let's analyze the clinical scenario following a thyroidectomy:

(a) During ligation of the inferior thyroid artery at the lower pole of the thyroid gland, the **recurrent laryngeal nerve** is at high risk of accidental clamping, traction, or division.

(b) Severing this nerve paralyzes the ipsilateral intrinsic laryngeal muscles, including the posterior cricoarytenoid (the sole abductor of the vocal folds).

(c) This results in the vocal fold becoming fixed in a semi-adducted position, presenting clinically as severe, persistent hoarseness.

Final Answer: Recurrent laryngeal nerve

Answer: (C)

Go Back to Question 12

Q13.

Solution

Concept: The pterygopalatine fossa is a small, inverted-pyramid-shaped space located deep within the skull, acting as an anatomical crossroads. It communicates with the middle cranial fossa posteriorly via two openings: the **foramen rotundum** and the pterygoid (Vidian) canal.

Solution:

Let's track the route that leads directly to the middle cranial fossa:

(a) The **foramen rotundum** opens directly through the greater wing of the sphenoid bone, connecting the posterior wall of the pterygopalatine fossa to the middle cranial fossa.

(b) This foramen transmits the **maxillary nerve (V_2)**. Aggressive tumors displaying perineural invasion along the branches of V_2 utilize this foramen as a direct retrograde pathway into the intracranial compartment.

(c) While the sphenopalatine foramen opens medially into the nasal cavity and the inferior orbital fissure opens superiorly into the orbit, the foramen rotundum leads directly into the middle cranial fossa.

Final Answer: Foramen rotundum

Answer: (A)

Go Back to Question 13

Q14.

Solution

Concept: The pharyngeal (branchial) arches are embryological structures that give rise to specific skeletal, muscular, and neural components of the head and neck. Each arch contains a core of mesoderm and neural crest cells. The **first pharyngeal arch** (mandibular arch) is responsible for forming the structures of the lower face and two of the auditory ossicles.

Solution:

Let's identify the derivatives of the targeted developmental zone labeled **Arch A**:

(a) Look at the diagram: **Arch A** is the most cranial bump, representing the first pharyngeal arch.

(b) The cartilaginous component of the first arch is **Meckel's cartilage**.

(c) The dorsal end of Meckel's cartilage ossifies during development to form two of the middle ear ossicles: the **malleus** and the **incus**.

(d) Defective neural crest cell migration into this first arch causes severe craniofacial syndromes (such as Pierre Robin sequence or Treacher Collins syndrome), characterized by micrognathia and cleft palate.

Final Answer: First Pharyngeal Arch (Mandibular Arch)

Answer: (A)

Go Back to Question 14

Q15.

Solution

Concept: During early cardiac development, the outflow tract of the heart—consisting of the truncus arteriosus and bulbus cordis—must be divided into separate channels. This division requires neural crest cells to migrate and form a spiral **aorticopulmonary septum**. This septum spirals 180° to divide the outflow tract into the ascending aorta and the pulmonary trunk.

Solution:

Let's analyze the failure described:

(a) A total failure in the formation or development of this spiral aorticopulmonary septum prevents any division of the truncus arteriosus.

(b) This results in a single, massive trunk overriding both ventricles, which receives a mixture of oxygenated and deoxygenated blood.

(c) This specific embryological anomaly defines **Persistent Truncus Arteriosus**. In contrast, transposition involves a non-spiral division, and Tetralogy of Fallot involves an asymmetric displacement of the septum.

Final Answer: Persistent Truncus Arteriosus

Answer: (B)

Go Back to Question 15

Q16.

Solution

Concept: The histological organization of the gastrointestinal tract consists of four universal layers: mucosa, submucosa, muscularis propria, and serosa/adventitia. Individual organs are distinguished by unique modifications within these layers. The presence of specialized, highly branched mucus-secreting alkaline glands (**Brunner's glands**) confined entirely to the **submucosa** is the pathognomonic feature of the **duodenum**.

Solution:

Let's analyze the histological features shown in the diagram:

(a) Locate **Glands Z**: These multi-lobulated mucus glands are situated below the thick, dark line representing the muscularis mucosae, placing them strictly within the submucosal layer.

(b) Identify their function: These are Brunner's glands, which secrete a thick, bicarbonate-rich alkaline fluid (pH 8.1—9.3). This fluid neutralizes the highly acidic chyme entering the small intestine from the stomach, protecting the duodenal mucosa and optimizing the local pH for pancreatic digestive enzymes.

(c) Differentiate from other choices: The stomach has glands in the mucosa; the jejunum lacks submucosal glands; the ileum contains Peyer's patches (lymphoid aggregates) in the submucosa rather than mucous glands.

Final Answer: Duodenum (Brunner's Glands)

Answer: (C)

Go Back to Question 16

Q17.

Solution

Concept: The classic structural and functional unit of the **liver** is the hepatic lobule. This hexagonal parenchymal structure is organized around a central draining venous channel, with cords of hepatocytes radiating outward toward peripheral portal triads.

Solution:

Let's correlate the light microscope findings with the target organ:

(a) **Polygonal cell plates:** These represent **hepatocytes**, which are arranged in one-cell-thick cords or plates that radiate away from a central hub.

(b) **Central vein:** The core axis of each hepatic lobule is the **central vein**, which collects blood from the surrounding sinusoids and directs it toward the sublobular and hepatic veins.

(c) **Fenestrated sinusoids and Kupffer cells:** The spaces between hepatocyte plates are occupied by wide, leaky capillaries called hepatic sinusoids. Enclosed within these walls are **Kupffer cells**, specialized resident macrophages that clear particulate debris, old erythrocytes, and gut-derived bacteria from the portal blood supply.

Final Answer: Liver

Answer: (B)

Go Back to Question 17

Answer Key

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