

## NEET PG Anatomy Sample Paper-2

Duration: 15 Minutes

Maximum Marks: 68

### Instructions

- This paper contains **25** 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 45-year-old male presents with a persistent cough and hoarseness of voice. Radiological imaging reveals an aneurysm of the aortic arch. Which of the following structural relationships explains how this condition leads to his presentation?

- (A) Compression of the right recurrent laryngeal nerve as it loops around the subclavian artery
- (B) Compression of the left recurrent laryngeal nerve as it loops inferior to the ligamentum arteriosum
- (C) Compression of the right phrenic nerve as it passes anterior to the lung root
- (D) Compression of the left phrenic nerve as it descends lateral to the fibrous pericardium

**Q2.** During a neurosurgery workshop, a student is asked to identify the anatomical landmark that separates the primary motor cortex from the primary somatosensory cortex. Which of the following correct options should the student select?

- (A) Lateral sulcus
- (B) Central sulcus



- (C) Parieto-occipital sulcus
- (D) Cingulate sulcus

**Q3.** A 28-year-old professional singer undergoes a thyroidectomy for a benign nodule. Post-operatively, she notices that while her voice is not hoarse, she can no longer hit high-pitched notes. Injury to which nerve is most likely responsible for this deficit?

- (A) Left recurrent laryngeal nerve
- (B) Right recurrent laryngeal nerve
- (C) External branch of the superior laryngeal nerve
- (D) Internal branch of the superior laryngeal nerve

**Q4.** A histology slide of an elastic artery is examined under high power. The characteristic internal elastic lamina appears highly fenestrated. Which of the following statements best describes the primary functional significance of these fenestrations?

- (A) To allow the entry of fibroblasts for repairing the tunica intima
- (B) To facilitate the diffusion of nutrients from the lumen to the deep layers of the tunica media
- (C) To provide anchoring sites for smooth muscle cell dense bodies
- (D) To synthesize extracellular matrix components within the tunica adventitia

**Q5.** A newborn infant is diagnosed with an imperforate anus. During surgical correction, the surgeon notes that the hindgut failed to communicate normally with the ectodermal invagination. Which of the following embryological structures is primarily responsible for forming the lower one-third of the anal canal?

- (A) Cloaca
- (B) Proctodeum
- (C) Allantois

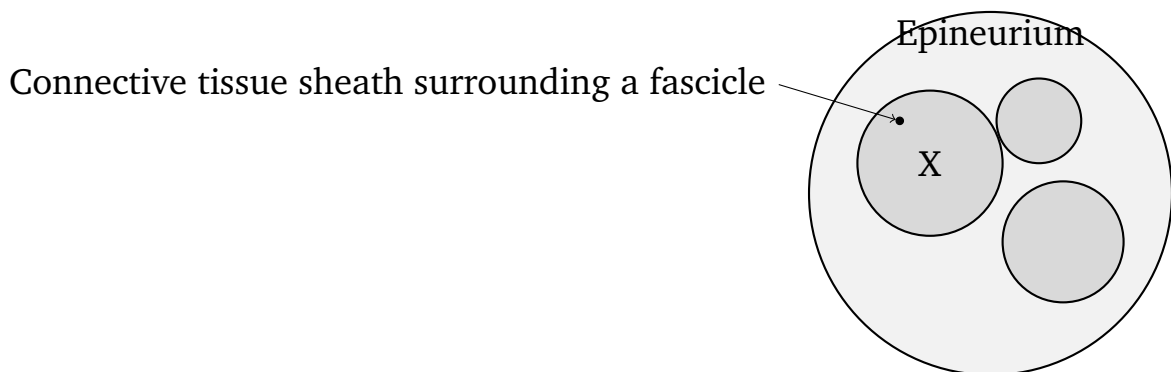


(D) Urogenital sinus

**Q6.** A 52-year-old female presents to the orthopedic clinic complaining of severe pain and instability in her right knee after a slip-and-fall accident. On physical examination, the anterior drawer test is positive. Which anatomical attachment site is crucial for the ligament injured in this patient?

- (A) Anterior part of the intercondylar area of the tibia to the medial condyle of the femur
- (B) Posterior part of the intercondylar area of the tibia to the lateral condyle of the femur
- (C) Posterior part of the intercondylar area of the tibia to the lateral surface of the medial condyle of the femur
- (D) Anterior part of the intercondylar area of the tibia to the medial surface of the lateral condyle of the femur

**Q7.** Consider the following schematic diagram representing the cross-section of a peripheral nerve trunk:



What is the specific anatomical name of the connective tissue sheath labeled as the target of the arrow surrounding the individual fascicle 'X'?

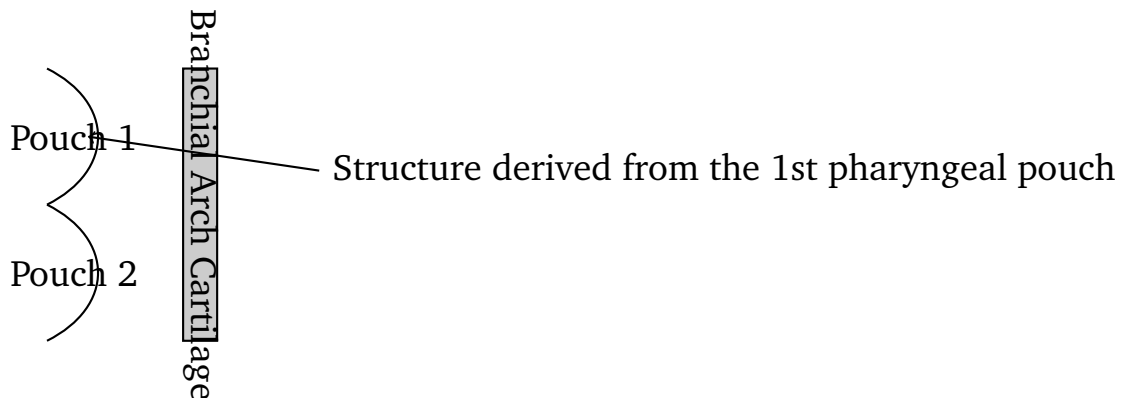
- (A) Epineurium
- (B) Perineurium
- (C) Endoneurium
- (D) Paraneurium



- Q8.** A 34-year-old male is brought to the emergency department following a motor vehicle collision. A neurological examination reveals a loss of pain and temperature sensation on the right side of the body below the T10 dermatome, alongside a loss of conscious proprioception and motor function on the left side below T10. Which spinal cord lesion is most consistent with these findings?
- (A) Complete transection of the spinal cord at T10
  - (B) Left-sided hemisection of the spinal cord at T10
  - (C) Right-sided hemisection of the spinal cord at T10
  - (D) Central cord syndrome affecting the T10 segment
- Q9.** A 60-year-old chronic smoker presents with a lung mass located in the apex of the right lung (Pancoast tumor). He exhibits miosis, ptosis, and anhidrosis on the right side of his face. Injury to which of the following structures best accounts for this triad of symptoms?
- (A) Cervical sympathetic chain
  - (B) Oculomotor nerve
  - (C) Long thoracic nerve
  - (D) Ansa cervicalis
- Q10.** A 23-year-old male sustains a deep laceration in the proximal part of his arm during a sports injury. Neurological evaluation reveals a complete loss of extension at the wrist joint (wrist drop) and loss of sensation over the posterior aspect of the forearm and the dorsum of the first web space. Which nerve has been transected?
- (A) Median nerve
  - (B) Ulnar nerve
  - (C) Musculocutaneous nerve
  - (D) Radial nerve



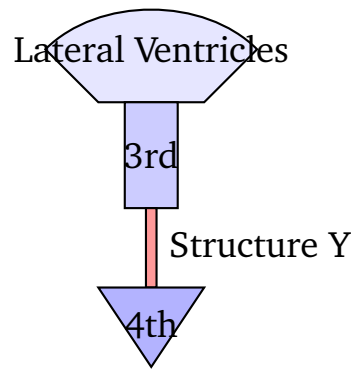
**Q11.** A medical student is analyzing a schematic representation of a developing branchial arch system during early embryonic life:



Which of the following structures is derived from the embryological region indicated as Pouch 1?

- (A) Palatine tonsil crypts
  - (B) Inferior parathyroid gland
  - (C) Epithelial lining of the auditory (Eustachian) tube
  - (D) Superior parathyroid gland
- Q12.** A patient presents with acute appendicitis. The surgeon explains that the pain was initially vague and poorly localized around the umbilicus before shifting and localizing precisely to the right iliac fossa (McBurney's point). Which nerve fibers are responsible for transmitting the initial, poorly localized peri-umbilical pain?
- (A) General somatic afferent (GSA) fibers in the T10 spinal nerve
  - (B) General visceral afferent (GVA) fibers running with the sympathetic nerves to the T10 segment
  - (C) General visceral afferent (GVA) fibers running with the vagus nerve
  - (D) General somatic afferent (GSA) fibers in the iliohypogastric nerve
- Q13.** A schematic diagram of the ventricular system of the brain is shown below:





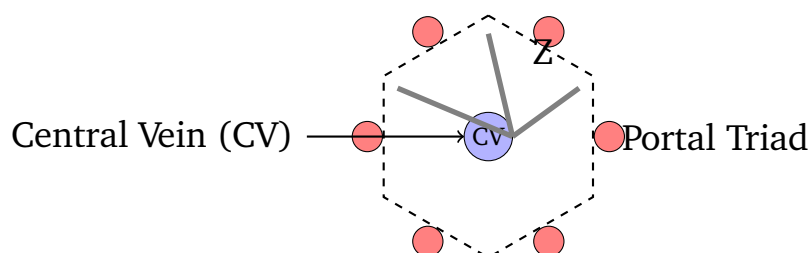
An obstruction occurs at the narrow channel labeled as 'Structure Y'. Which condition will develop as a direct consequence of this localized occlusion?

- (A) Communicating hydrocephalus involving all ventricles
- (B) Isolated enlargement of the fourth ventricle
- (C) Dilation of only the lateral ventricles while the third ventricle remains normal
- (D) Non-communicating hydrocephalus with dilation of the lateral and third ventricles only

**Q14.** During an elective inguinal hernia repair, the surgical resident must identify the boundaries of Hesselbach’s triangle to avoid damaging the inferior epigastric vessels. Which of the following correctly describes the medial boundary of this triangle?

- (A) Inguinal ligament
- (B) Lateral border of the rectus abdominis muscle
- (C) Inferior epigastric artery
- (D) Conjoint tendon

**Q15.** The following line drawing illustrates the cross-section of a hepatic lobule:



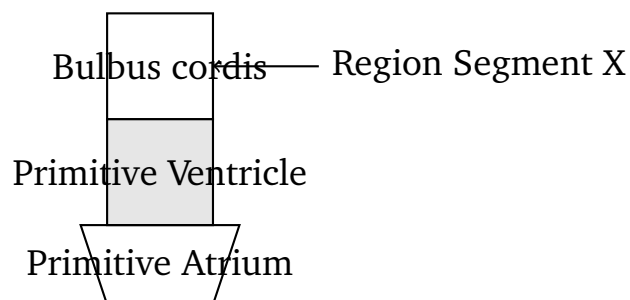
The vascular channels labeled as 'Z' run between plates of hepatocytes, carrying mixed blood from the portal triad to the central vein. What type of capillaries are these specialized structures?

- (A) Continuous capillaries with tight junctions
- (B) Fenestrated capillaries without diaphragms
- (C) Sinusoidal (discontinuous) capillaries
- (D) Lymphatic capillaries

**Q16.** A 68-year-old man presents with acute loss of vision in his right eye. On examination, a pupillary reflex test demonstrates that when light is shone into the right eye, neither pupil constricts. However, when light is shone into the left eye, both pupils constrict normally. Which of the following structures is damaged?

- (A) Right optic nerve
- (B) Right oculomotor nerve
- (C) Left oculomotor nerve
- (D) Left optic nerve

**Q17.** The diagram below shows the schema of the developing primitive heart tube during early cardiac morphogenesis:



Which adult cardiovascular structure is primarily derived from the proximal portion of the 'Bulbus cordis' labeled as Region Segment X?

- (A) Trabeculated part of the right ventricle
- (B) Smooth part of the right ventricle (conus arteriosus) and left ventricle (aortic vestibule)

- (C) Ascending aorta and pulmonary trunk
- (D) Smooth part of the right atrium (sinus venarum)



**Detailed Solutions**

Q1.

**Solution**

**Concept:** The recurrent laryngeal nerve is a branch of the vagus nerve (CN X) that supplies intrinsic muscles of the larynx. Due to asymmetrical embryonic development of the aortic arches, the left and right recurrent laryngeal nerves follow completely different paths in the superior mediastinum and neck.

**Solution:**

- (a) During development, the left recurrent laryngeal nerve loops inferior to the sixth aortic arch, which persists as the ligamentum arteriosum in adults. Consequently, the left nerve is located in the thorax, looping beneath the arch of the aorta immediately lateral to the ligamentum arteriosum.
- (b) The right recurrent laryngeal nerve loops around the right subclavian artery (a derivative of the fourth aortic arch) in the root of the neck and does not enter the mediastinum or thorax.
- (c) Pathologies within the thoracic cavity, such as an expanding aortic arch aneurysm, mediastinal lymphadenopathy, or a Pancoast tumor of the left lung apex, can compress the left recurrent laryngeal nerve against the aortic arch or ligamentum arteriosum.
- (d) This compression results in axon damage, leading to paralysis of the left vocal cord (except the cricothyroid muscle), which clinically presents as persistent hoarseness of voice, bovine cough, and vocal fatigue.

**Final Answer:** Compression of the left recurrent laryngeal nerve as it loops inferior to the ligamentum arteriosum

**Answer: (B)**

[Go Back to Question 1](#)



Q2.

**Solution**

**Concept:** The cerebral cortex is organized into distinct functional areas separated by specific anatomical grooves called sulci. Understanding these surface landmarks is essential for neurosurgical localization and predicting functional deficits from cortical lesions.

**Solution:**

- (a) The central sulcus (of Rolando) is a prominent groove running down the lateral surface of the cerebral hemisphere, separating the frontal lobe anteriorly from the parietal lobe posteriorly.
- (b) The gyrus immediately anterior to the central sulcus is the precentral gyrus, which houses the primary motor cortex (Brodmann area 4) responsible for controlling voluntary motor movements.
- (c) The gyrus immediately posterior to the central sulcus is the postcentral gyrus, which contains the primary somatosensory cortex (Brodmann areas 3, 1, 2) responsible for integrating somatic sensations like touch and proprioception.
- (d) Other sulci serve different boundaries: the lateral sulcus separates the temporal lobe from the frontal and parietal lobes, the parieto-occipital sulcus separates the parietal and occipital lobes, and the cingulate sulcus is located on the medial surface of the hemisphere.

**Final Answer:** Central sulcus

**Answer: (B)**

[Go Back to Question 2](#)



Q3.

**Solution**

**Concept:** The superior laryngeal nerve arises from the inferior ganglion of the vagus nerve and divides into an internal and an external branch. These branches have completely distinct sensory and motor roles within the larynx, making them prone to specific surgical injuries during anterior neck procedures.

**Solution:**

- (a) The internal branch of the superior laryngeal nerve runs alongside the superior laryngeal artery, pierces the thyrohyoid membrane, and provides purely sensory innervation to the laryngeal mucosa above the vocal folds.
- (b) The external branch of the superior laryngeal nerve courses down along the inferior pharyngeal constrictor muscle, running in close proximity to the superior thyroid artery before supplying the cricothyroid muscle.
- (c) The cricothyroid muscle is the only intrinsic laryngeal muscle not supplied by the recurrent laryngeal nerve. Its primary function is to tilt the thyroid cartilage forward, thereby tensing and elongating the vocal cords.
- (d) Damage to the external branch during a thyroidectomy prevents tension of the vocal cords. While regular speech and tone remain largely unaffected (no hoarseness), the patient loses the ability to produce high-pitched sounds and experiences rapid vocal fatigue.

**Final Answer:** External branch of the superior laryngeal nerve

**Answer: (C)**

[Go Back to Question 3](#)



Q4.

**Solution**

**Concept:** Large conduit vessels, known as elastic arteries (e.g., aorta, brachiocephalic, subclavian), experience immense hydrostatic pressure changes during the cardiac cycle. Their walls contain structural modifications optimized to facilitate metabolic support across thick tissue barriers.

**Solution:**

- (a) The wall of an elastic artery consists of three distinct layers: the tunica intima, a highly developed tunica media containing concentric sheets of elastic lamellae, and a supportive outer tunica adventitia.
- (b) The internal elastic lamina forms the boundary between the intima and media. In elastic arteries, this lamina and the subsequent media sheets are highly fenestrated, meaning they contain multiple microscopic window-like openings.
- (c) Because the tunica media of these large arteries is extremely thick, the smooth muscle cells located in its deeper layers cannot receive adequate nutrition or oxygen solely via the vasa vasorum arising from the adventitia.
- (d) The fenestrations within the internal elastic lamina permit blood plasma and dissolved nutrients from the arterial lumen to diffuse freely through the intercellular spaces to maintain the metabolic demands of the medial cells.

**Final Answer:** To facilitate the diffusion of nutrients from the lumen to the deep layers of the tunica media

**Answer: (B)**

[Go Back to Question 4](#)



Q5.

**Solution**

**Concept:** The development of the gastrointestinal tract involves distinct embryological origins for the upper and lower portions of the anal canal. These origins meet at an important clinical landmark known as the pectinate (dentate) line.

**Solution:**

- (a) The upper two-thirds of the anal canal develops from the terminal part of the hindgut, which is endodermal in origin and is supplied by the superior rectal artery (a branch of the inferior mesenteric artery).
- (b) The lower one-third of the anal canal develops from an ectodermal invagination of the surface ectoderm known as the proctodeum (or anal pit). It receives arterial supply from the inferior rectal arteries via the internal pudendal artery.
- (c) The invagination of the proctodeum deepens until it meets the endodermal hindgut at the cloacal membrane, which normally ruptures during the eighth week of gestation to establish continuity.
- (d) Failure of the proctodeum to properly invaginate, or failure of the cloacal membrane to perforate, interrupts this communication pathway, resulting in congenital anorectal malformations such as an imperforate anus.

**Final Answer:** Proctodeum

**Answer: (B)**

[Go Back to Question 5](#)



Q6.

**Solution**

**Concept:** The stability of the knee joint relies heavily on intra-articular ligaments, primarily the anterior cruciate ligament (ACL) and the posterior cruciate ligament (PCL). These ligaments prevent abnormal translation of the tibia relative to the femur.

**Solution:**

- (a) A positive anterior drawer test indicates that the tibia can be abnormally pulled forward relative to the femur, confirming a mechanical structural tear of the anterior cruciate ligament (ACL).
- (b) The ACL originates inferiorly from the anterior part of the intercondylar area of the tibia, immediately behind the attachment of the medial meniscus.
- (c) From its tibial origin, the ligament courses superiorly, posteriorly, and laterally through the joint space to insert on the posterior part of the medial surface of the lateral condyle of the femur.
- (d) Erroneous interpretations often confuse the attachments with the PCL, which arises from the posterior intercondylar area of the tibia and attaches to the lateral surface of the medial femoral condyle.

**Final Answer:** Anterior part of the intercondylar area of the tibia to the medial surface of the lateral condyle of the femur

**Answer: (D)**

[Go Back to Question 6](#)



Q7.

**Solution**

**Concept:** Peripheral nerves are organized into a strict hierarchical scheme protected by three distinct concentric layers of connective tissue. These layers provide mechanical strength, continuous insulation, and blood supply tracking via the vasa nervorum.

**Solution:**

- (a) The outermost layer of a peripheral nerve trunk is the epineurium, a dense irregular connective tissue sheath that encloses the entire nerve and cushions it against external trauma.
- (b) Within the nerve trunk, axons are bundled together into structural units called nerve fascicles. Each individual fascicle is wrapped by a specialized, cellular connective tissue layer known as the perineurium.
- (c) The perineurium consists of layers of flattened bi-lamellar perineurial cells linked by tight junctions, forming a highly effective blood-nerve barrier that regulates the microenvironment of the axons.
- (d) Inside the fascicle, individual nerve fibers (axons) along with their supporting Schwann cells are embedded in a delicate, thin connective tissue matrix called the endoneurium.

**Final Answer:** Perineurium

**Answer: (B)**

[Go Back to Question 7](#)



Q8.

**Solution**

**Concept:** Brown-Séquard syndrome results from a clean hemisection of the spinal cord. Because different ascending sensory pathways and descending motor pathways decussate at different anatomical levels, a unilateral spinal lesion creates highly characteristic asymmetrical deficits.

**Solution:**

- (a) The lateral corticospinal tract (motor function) and dorsal columns (conscious proprioception, fine touch, vibration) decussate superiorly in the medulla. Therefore, a lesion at T10 causes ipsilateral motor loss and ipsilateral loss of proprioception below T10.
- (b) The spinothalamic tract (pain and temperature sensation) enters the spinal cord via the dorsal roots, ascends 1 to 2 segments, and decussates in the anterior white commissure to travel up the contralateral side.
- (c) Consequently, damage to the spinothalamic tract on the left side of the cord at the T10 segment results in a loss of pain and temperature sensation on the right side of the body below that level.
- (d) The combination of left-sided motor and proprioceptive loss with right-sided pain and temperature loss points definitively to a left-sided hemisection of the T10 spinal cord segment.

**Final Answer:** Left-sided hemisection of the spinal cord at T10

**Answer: (B)**

[Go Back to Question 8](#)



Q9.

**Solution**

**Concept:** Horner syndrome is caused by an interruption of the sympathetic nerve pathway supplying the head and neck. It can be triggered by structural lesions located anywhere along its long, three-neuron oculo-sympathetic arc.

**Solution:**

- (a) First-order neurons descend from the hypothalamus to the ciliospinal center of Budge (T1–T2). Second-order preganglionic fibers emerge from the spinal cord, enter the sympathetic chain, and ascend over the apex of the lung to synapse in the superior cervical ganglion.
- (b) A malignant tumor at the apex of the right lung (Pancoast tumor) frequently invades neighboring structural relationships, including the lower roots of the brachial plexus and the cervical sympathetic chain.
- (c) Destruction of these preganglionic sympathetic fibers blocks sympathetic tone to the head, leading to the clinical presentation of ipsilateral miosis (unopposed pupillary constriction), ptosis (paralysis of Müller’s tarsal muscle), and anhidrosis (loss of sweat gland stimulation).
- (d) The oculomotor nerve provides parasympathetic innervation; its damage would cause a dilated pupil and severe ptosis, rather than the constricted pupil characteristic of sympathetic loss.

**Final Answer:** Cervical sympathetic chain

**Answer: (A)**

[Go Back to Question 9](#)



Q10.

**Solution**

**Concept:** The radial nerve originates from the posterior cord of the brachial plexus and supplies the extensor compartments of both the arm and forearm. It is highly vulnerable to traumatic injuries along its course near the humerus.

**Solution:**

- (a) The radial nerve travels through the axilla, moves posteriorly into the radial (spiral) groove of the humerus, and then pierces the lateral intermuscular septum to enter the anterior compartment of the arm before crossing the elbow.
- (b) A deep laceration or fracture in the proximal/middle part of the arm damages the nerve trunk prior to the branching of its motor fibers to the extensor muscles of the wrist and fingers (e.g., extensor carpi radialis longus, extensor digitorum).
- (c) Denervation of these muscles leaves the flexor muscles unopposed, resulting in the clinical presentation of wrist drop.
- (d) Sensory branches, including the posterior cutaneous nerve of the forearm and the superficial branch of the radial nerve, are also severed, causing cutaneous anesthesia across the posterior forearm and the dorsal aspect of the first web space.

**Final Answer:** Radial nerve

**Answer: (D)**

[Go Back to Question 10](#)



Q11.

**Solution**

**Concept:** The pharyngeal (branchial) apparatus consists of pharyngeal arches, pouches, and clefts that contribute significantly to the development of the head and neck. Each pharyngeal pouch is lined by endoderm and differentiates into specific epithelial organs and structural channels in the adult.

**Solution:**

- (a) The first pharyngeal pouch expands laterally into a elongated diverticulum called the tubotympanic recess. The distal blind end of this recess widens to form the primitive tympanic (middle ear) cavity, while the proximal narrow portion remains open to form the auditory (Eustachian) tube.
- (b) The second pharyngeal pouch is largely obliterated by the developing tonsil, but its endodermal lining proliferates to form the buds and epithelial lining of the palatine tonsil crypts.
- (c) The third pharyngeal pouch differentiates into the inferior parathyroid glands and the thymus gland, which migrate inferiorly together into the lower neck and anterior mediastinum.
- (d) The fourth pharyngeal pouch gives rise to the superior parathyroid glands and the ultimobranchial body, which incorporates into the thyroid gland as calcitonin-producing parafollicular C cells.

**Final Answer:** Epithelial lining of the auditory (Eustachian) tube

**Answer: (C)**

[Go Back to Question 11](#)



Q12.

**Solution**

**Concept:** Visceral pain and somatic pain utilize entirely separate neural pathways, explaining the classic clinical transition of pain localization observed in acute abdominal conditions like appendicitis.

**Solution:**

- (a) Early appendiceal inflammation causes luminal distension, stimulating general visceral afferent (GVA) pain fibers that travel retrogradely alongside sympathetic pathways. These afferents enter the spinal cord at the T10 segment via the lesser splanchnic nerve.
- (b) Because visceral sensory inputs are sparse and converge with somatic inputs within the spinal cord dorsal horn, the brain interprets this early visceral pain poorly, localizing it vaguely to the T10 dermatome around the umbilicus.
- (c) As the inflammatory process advances, it breaches the visceral wall to irritate the adjacent parietal peritoneum of the right iliac fossa, which is richly innervated by general somatic afferent (GSA) fibers.
- (d) These somatic afferent fibers travel via lower intercostal nerves, providing highly precise, sharp localized pain directly at McBurney point, marking the transition from visceral periumbilical pain to localized somatic pain.

**Final Answer:** General visceral afferent (GVA) fibers running with the sympathetic nerves to the T10 segment

**Answer: (B)**

[Go Back to Question 12](#)



Q13.

**Solution**

**Concept:** Cerebrospinal fluid (CSF) flows through a specific sequence of ventricles and channels within the brain before entering the subarachnoid space. Obstructions within this ventricular pathway cause non-communicating (obstructive) hydrocephalus.

**Solution:**

- (a) CSF is produced primarily by the choroid plexus inside the lateral ventricles, passing through the paired interventricular foramina of Monro to enter the midline third ventricle.
- (b) From the third ventricle, CSF travels through a narrow, vulnerable conduit in the midbrain known as the cerebral aqueduct of Sylvius (labeled as Structure Y) to reach the fourth ventricle.
- (c) An obstruction at the cerebral aqueduct blocks downstream fluid movement into the fourth ventricle, preventing CSF from reaching the lateral apertures of Luschka and the median aperture of Magendie.
- (d) Consequently, fluid continuously accumulates upstream from the block, causing isolated pathologically high pressure and dilation of the lateral and third ventricles, while the fourth ventricle remains normal or small.

**Final Answer:** Non-communicating hydrocephalus with dilation of the lateral and third ventricles only

**Answer: (D)**

[Go Back to Question 13](#)



Q14.

**Solution**

**Concept:** The inguinal triangle (Hesselbach triangle) is an important anatomical region on the inner aspect of the lower anterior abdominal wall. It defines the site through which direct inguinal hernias protrude through the transverse fascia.

**Solution:**

- (a) Hesselbach triangle is bound by three distinct anatomical landmarks that must be clearly visualized during open or laparoscopic inguinal hernia repairs to prevent vascular injury.
- (b) The lateral boundary of the triangle is formed by the inferior epigastric artery and vein, which course superomedially from the external iliac vessels toward the rectus sheath.
- (c) The inferior boundary (base) of the triangle is formed by the medial portion of the inguinal ligament (Poupart ligament) as it extends toward the pubic tubercle.
- (d) The medial boundary is formed by the linear outer edge of the rectus abdominis muscle, also referred to as the lateral border of the rectus abdominis or rectus sheath. The conjoint tendon forms part of the reinforced floor posterior to this region.

**Final Answer:** Lateral border of the rectus abdominis muscle

**Answer: (B)**

[Go Back to Question 14](#)



Q15.

**Solution**

**Concept:** The structural and functional unit of the liver is the hepatic lobule, which relies on a specialized capillary network to optimize metabolic exchange between blood circulation and parenchyma cells.

**Solution:**

- (a) Blood enters the hepatic lobule at the periphery from the branches of the portal vein and hepatic artery located within the connective tissue of the portal triads.
- (b) This blood mixes and passes through wide, irregular vascular channels called hepatic sinusoids (labeled as Z) that converge radially toward the central vein located at the center of the lobule.
- (c) Hepatic sinusoids are classified as discontinuous (sinusoidal) capillaries because they feature large endothelial fenestrations without diaphragms and lack a continuous, well-defined basal lamina.
- (d) This highly porous structural design permits direct, unobstructed contact between macromolecules in the flowing blood and the microvilli of hepatocytes projecting into the underlying perisinusoidal space of Disse, facilitating efficient hepatic clearing and synthesis.

**Final Answer:** Sinusoidal (discontinuous) capillaries

**Answer: (C)**

[Go Back to Question 15](#)



Q16.

**Solution**

**Concept:** The pupillary light reflex requires a functional reflex arc comprising an afferent limb, central processing nuclei in the midbrain, and an efferent limb to control iridial sphincter constriction.

**Solution:**

- (a) The afferent pathway begins when light strikes retinal photoreceptors, transmitting nerve impulses along the optic nerve (CN II), optic chiasm, and optic tract to synapse bilaterally in the pretectal nuclei of the midbrain.
- (b) From the pretectal nuclei, fibers project bilaterally to both the right and left Edinger-Westphal nuclei, which provide preganglionic parasympathetic fibers to the oculomotor nerve (CN III), forming the efferent limb.
- (c) Shining light into the right eye fails to stimulate either Edinger-Westphal nucleus because the right optic nerve is damaged, resulting in a total absence of both the direct and consensual pupillary responses.
- (d) When light is shone into the intact left eye, the left optic nerve transmits signals normally to both sides of the midbrain, inducing normal direct and consensual pupillary constriction, confirming that both oculomotor nerves are intact.

**Final Answer:** Right optic nerve

**Answer: (A)**

[Go Back to Question 16](#)



Q17.

**Solution**

**Concept:** During early embryonic development, the primitive heart tube undergoes looping and segmentation. Each segment is genetically programmed to expand and differentiate into specific structural components of the adult cardiovascular system.

**Solution:**

- (a) The primitive heart tube consists of several key dilations from cranial to caudal: the truncus arteriosus, bulbus cordis, primitive ventricle, primitive atrium, and sinus venosus.
- (b) The bulbus cordis is further sub-divided into three zones. The distal portion transitions into the conotruncus, which along with the truncus arteriosus forms the outflow tracts including the ascending aorta and pulmonary trunk.
- (c) The middle segment (conus cordis) forms the smooth outflow pathways of both ventricles, known as the conus arteriosus in the right ventricle and the aortic vestibule in the left ventricle.
- (d) The proximal segment of the bulbus cordis (labeled as Segment X) integrates directly into the developing ventricular complex, giving rise specifically to the heavily trabeculated portion of the right ventricle.

**Final Answer:** Trabeculated part of the right ventricle

**Answer: (A)**

[Go Back to Question 17](#)



**Answer Key**

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

