NEET PG Anatomy Sample Paper-3

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 52-year-old male presents with a deep laceration in the proximal part of the palm. Physical examination reveals loss of abduction and opposition of the thumb, while sensation over the thenar eminence remains intact. Which of the following nerve branches is most likely injured?

(A) Palmar cutaneous branch of the median nerve

(B) Recurrent branch of the median nerve

(C) Deep branch of the ulnar nerve

(D) Anterior interosseous nerve

Q2. During a surgical repair of a sliding hiatal hernia, the surgeon must identify the structures passing through the esophageal hiatus of the diaphragm. Which of the following structures normally traverses this opening alongside the esophagus?

(A) Right phrenic nerve

(B) Thoracic duct

(C) Anterior and posterior vagal trunks

(D) Left gastric artery

Q3. A 28-year-old athlete undergoes an open repair for an indirect inguinal hernia. The surgeon identifies the hernia sac emerging lateral to the inferior epigastric vessels. Which of the following layers forms the internal spermatic fascia within this region?

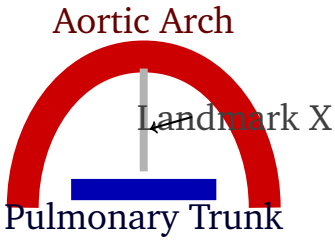
(A) Fascia transversalis

(B) Internal oblique aponeurosis

(C) External oblique aponeurosis

(D) Scarpa's fascia

Q4. A 62-year-old chronic smoker presents with severe chest pain and dyspnea. A CT angiogram reveals an aneurysm of the aortic arch. The patient exhibits hoarseness of voice. This presentation is best explained by compression of a nerve that loops inferior to which structural landmark?



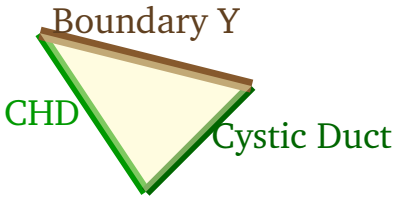
(A) Right subclavian artery

(B) Ligamentum arteriosum

(C) Left main bronchus

(D) Terminal part of the azygos vein

Q5. An elective cholecystectomy is being performed. To safely ligate the cystic artery, the surgeon carefully dissects Calot's triangle. Which of the following structures forms the superior boundary of this anatomical space?



(A) Cystic artery

(B) Common bile duct

(C) Portal vein

(D) Inferior surface of the liver

Q6. A patient is admitted with an occlusion of the micro-vessels supplying the hindgut segment of the gastrointestinal tract. Which of the following arteries is primarily responsible for the systemic arterial supply to this embryonic division?

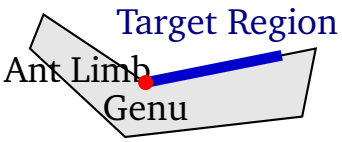
(A) Celiac trunk

(B) Superior mesenteric artery

(C) Inferior mesenteric artery

(D) Median sacral artery

Q7. A 58-year-old female presents with sudden-onset weakness of her right upper and lower limbs. Neuroradiological evaluation demonstrates a localized ischemic stroke in the posterior limb of the internal capsule. Which of the following somatotopic projections is predominantly affected in this specific tract segment?



(A) Corticobulbar fibers

(B) Corticospinal fibers

(C) Frontopontine fibers

(D) Auditory radiations

Q8. An advanced neurological evaluation of a patient shows a block in the flow of cerebrospinal fluid within the central nervous system, leading to non-communicating hydrocephalus. The obstruction is isolated to the narrow passageway connecting the third and fourth ventricles. This block is located within which macrostructural brain division?

(A) Diencephalon

(B) Midbrain

(C) Pons

(D) Medulla oblongata

Q9. A 69-year-old male is diagnosed with Weber's syndrome following a localized vascular occlusion of the paramedian branches of the posterior cerebral artery. Neurological examination reveals ipsilateral oculomotor nerve palsy accompanied by contralateral hemiplegia. In which portion of the brainstem does this classic lesion reside?

(A) Dorsal tegmentum of the midbrain

(B) Lateral medulla oblongata

(C) Ventral crus cerebri of the midbrain

(D) Basilar part of the pons

Q10. A patient presents with an inability to coordinate fine motor movements, showing significant dysmetria and intention tremors on the left side of the body. A structural lesion is suspected in the cerebellar hemisphere. Which of the following options correctly matches the side of the lesion with the fundamental tract organization involved?

(A) Left cerebellar hemisphere; tracts exert an ipsilateral influence via double-crossing

(B) Right cerebellar hemisphere; tracts remain completely uncrossed throughout

(C) Right cerebellar hemisphere; tracts exert a contralateral influence via single-crossing

(D) Left cerebellar hemisphere; tracts cross exclusively to the contralateral cord levels

Q11. A 34-year-old woman undergoes a total thyroidectomy for a malignant nodule. During the ligation of the inferior thyroid artery close to the posterior

aspect of the thyroid gland, which nerve is at the highest risk of accidental injury?

(A) External laryngeal nerve

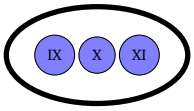
(B) Internal laryngeal nerve

(C) Recurrent laryngeal nerve

(D) Superior laryngeal nerve

Q12. A 52-year-old male suffers a fracture of the skull base extending through the jugular foramen. On examination, the patient demonstrates loss of taste sensation on the posterior one-third of the tongue, an absent gag reflex, and weakness when shrugging his right shoulder. Which cranial nerves are transmitting fibers through this bony exit portal?

Jugular Foramen Content



(A) CN VII, CN VIII, and CN IX

(B) CN IX, CN X, and CN XI

(C) CN X, CN XI, and CN XII

(D) CN IX, CN XI, and CN XII

Q13. A patient is diagnosed with an infection within the pterygopalatine fossa that has spread superiorly into the orbit. Which of the following structural pathways acts as the anatomical conduit connecting the pterygopalatine fossa directly to the orbit?

(A) Foramen rotundum

(B) Pterygoid canal

(C) Inferior orbital fissure

(D) Superior orbital fissure

Q14. A newborn is evaluated for cyanosis and a harsh pansystolic murmur. Echocardiography confirms Tetralogy of Fallot. This congenital cardiac defect stems

fundamentally from the abnormal development and malalignment of which embryological structure?

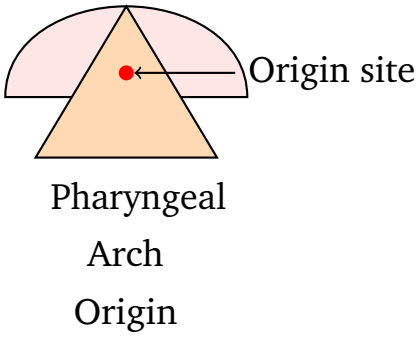
(A) Septum primum

(B) Septum secundum

(C) Truncoconal (aorticopulmonary) septum

(D) Endocardial cushions

Q15. A 3-year-old boy presents with a painless mass in the midline of his neck, located just inferior to the hyoid bone. The mass moves upward when the patient protrudes his tongue. This clinical condition arises due to the incomplete obliteration of a pathway derived from which developmental location?



(A) First pharyngeal pouch

(B) Foramen caecum of the developing tongue

(C) Cervical sinus of His

(D) Thymic diverticulum

Q16. A pathology resident examines a biopsy specimen from the gastrointestinal tract under a light microscope. The section clearly displays simple columnar epithelium with goblet cells, prominent crypts of Lieberkühn, but lacks both villi and submucosal Brunner's glands. What is the most likely anatomical source of this tissue sample?

(A) Duodenum

(B) Jejunum

(C) Ileum

(D) Colon

Q17. A high-magnification histological examination of a skeletal muscle fiber reveals distinct banding patterns. The basic functional contractile unit, the sarcomere, is defined as the structural region contained between which two consecutive microscopic landmarks?

(A) M lines

(B) H zones

(C) Z lines

(D) A bands

Detailed Solutions

Q1.

Solution

Concept:

The hand features intricate networks of motor and sensory neural architectures derived from the brachial plexus terminal cords. The thenar eminence is heavily reliant on median nerve integrity for specialized opposable mechanics. A deep grasp of the relationship between superficial structures and the structural division branches allows accurate mapping of palmar wounds without confounding normal patterns.

Solution:

(a) The case presents specific localized paralysis affecting the muscular mechanisms of thumb abduction and opposition while preserving regional skin sensitivity.

(b) This clinical manifestation isolated to the hand intrinsic motor system points directly to an injury affecting the recurrent branch of the median nerve.

(c) The branch takes a highly superficial path after departing the carpal tunnel, crossing near the proximomedial palm where superficial cuts cause complete structural disruption.

(d) Sensory preservation across the lateral hand territory happens because the palmar cutaneous nerve splits off within the forearm, traveling superficial to the flexor retinaculum.

(e) Damage involving the deep ulnar branch instead yields selective palsy of the adductor muscle, whereas anterior interosseous issues present as deep finger flexor weakness.

Final Answer: The branch is Recurrent branch of the median nerve.

Answer: (B)

Go Back to Question 1

Q2.

Solution

Concept:

The thoracoabdominal muscular partition contains precise geometric apertures allowing structural elements to navigate across separate somatic cavities. These entry boundaries exist at distinct vertebral dimensions aligned along the vertical axis. Recognizing the specific secondary elements accompanying primary organs through these points remains necessary to avoid surgical complications during anti-reflux repair procedures.

Solution:

(a) The diaphragmatic esophageal aperture forms an anatomical hiatus within the decussating muscular bands of the right crus, located at the tenth thoracic vertebra level.

(b) Together with the primary alimentary conduit, the anterior and posterior vagal trunks cross through this opening to distribute autonomic plexuses within the abdomen.

(c) The right phrenic nerve avoids this path entirely, utilizing a separate pathway through the central tendon adjacent to the inferior vena cava opening.

(d) The thoracic duct ascends through a deeper retroperitoneal avenue at the twelfth thoracic level, tracking closely alongside the descending aorta.

(e) The left gastric artery starts as a branch of the celiac axis within the peritoneal space, never ascending above the diaphragm boundaries.

Final Answer: The structure is Anterior and posterior vagal trunks.

Answer: (C)

Go Back to Question 2

Q3.

Solution

Concept:

The anterior abdominal wall transitions into specialized structures near the pubic region, forming a bilateral canal that facilitates the migration of reproductive cords. As these structures advance into the scrotal environment, they carry serial reflections of the abdominal sheets. Each layer represents an extension of a distinct musculoskeletal layer.

Solution:

(a) An indirect path hernia exits the internal ring space lateral to the inferior epigastric vasculature by passing directly through the deepest wall layer.

(b) This structural aperture is situated within the continuous deep fascial lining of the abdomen, known explicitly as the fascia transversalis.

(c) As the reproductive cord invaginates this plane, the fascia transversalis transitions directly to produce the internal spermatic fascial layer.

(d) The middle cremasteric covering develops from muscle fibers and aponeurotic loops associated with the lower margins of the internal oblique muscle.

(e) The external fascial layer stems from the external oblique aponeurosis, while Scarpa's superficial tissue sits entirely separate from the cord coverings.

Final Answer: The layer is Fascia transversalis.

Answer: (A)

Go Back to Question 3

Q4.

Solution

Concept:

Vocal cords depend on precise motor tracks that showcase prominent lateral asymmetry due to complex embryological transformations of the branchial arches. Pathological expansile lesions inside the thoracic cavity frequently cause direct mechanical deformation of adjacent pathways. This relationship connects mediastinal vascular expansion with clinical laryngeal presentation.

Solution:

(a) The left recurrent laryngeal nerve separates from the primary vagus pathway anteriorly before tracing a recurring path under the main arterial arch.

(b) The specific structural anchor point for this loops is the ligamentum arteriosum, linking the pulmonary trunk and the aortic concavity.

(c) Pathological expansion of the vascular wall within this space creates compressive stresses that pin the nerve against this structural band.

(d) The mechanical insult causes motor axonal failure within the intrinsic laryngeal muscles, resulting in asymmetric vocal cord positioning and hoarseness.

(e) The right-sided partner nerve loops higher around the subclavian artery, preventing its involvement in deeper thoracic aortic arch pathology.

Final Answer: The landmark is Ligamentum arteriosum.

Answer: (B)

Go Back to Question 4

Q5.

Solution

Concept:

The hepatobiliary region incorporates standard geometric landmarks that surgeons map during gallbladder removal to safely locate critical structures. This triangular field consists of fixed visceral edges and specific ducts. Accurate isolation of these borders is key to avoiding structural injuries to the biliary tree.

Solution:

(a) Calot's triangle is defined by specific borders, incorporating the common hepatic conduit medially and the cystic duct along its lower border.

(b) The superior boundary of this anatomical space is formed by the inferior surface of the liver, specifically within segment five.

(c) The cystic artery travels inside the borders of this triangle, making it an internal structure rather than a boundary line.

(d) The main bile duct is formed lower down by the junction of these conduits, keeping it clear of the triangular space.

(e) Dissecting the connective tissue inside these boundaries ensures correct identification of the vascular supply before any division takes place.

Final Answer: The structure is Inferior surface of the liver.

Answer: (D)

Go Back to Question 5

Q6.

Solution

Concept:

The primitive digestive tube is organized into three developmental territories that guide the distribution of adult abdominal structures. Each zone relies on a dedicated, unpaired branch of the abdominal aorta. Vascular blocks within these primary vessels produce corresponding ischemic signs in their respective tissues.

Solution:

(a) The embryonic hindgut zone develops into the distal colon, descending segment, sigmoid loop, and upper portions of the anal canal.

(b) The vascular supply for this developmental territory is provided exclusively by the inferior mesenteric artery, which branches at the third lumbar level.

(c) The celiac axis provides blood supply further up, supporting foregut structures from the esophagus down to the mid-duodenum.

(d) The superior mesenteric artery supplies the intermediate midgut zone, which spans from the duodenum to the mid-transverse colon.

(e) The small median sacral branch splits off near the aortic bifurcation to supply regional pelvic bone structures rather than bowel segments.

Final Answer: The artery is Inferior mesenteric artery.

Answer: (C)

Go Back to Question 6

Q7.

Solution

Concept:

The subcortical white matter contains compressed pathways that link the cerebral mantle with downstream motor and sensory centers. This structure is split into limbs and a central genu, each carrying neatly arranged tracts. Small strokes within these dense areas disrupt specific, predictable physiological pathways.

Solution:

(a) The posterior limb sits between the thalamic nuclei and the lentiform mass, carrying vital motor and sensory projection tracks.

(b) The corticospinal tract descends through the anterior two-thirds of this posterior limb, organizing motor signals for the opposite side limbs.

(c) Corticobulbar lines carry signals for head and neck muscle control, passing through the genu rather than the posterior limb.

(d) Frontopontine tracts align further forward in the anterior limb, while auditory fibers pass lower down through the sublentiform zone.

(e) Ischemic blockages in this part of the brain alter voluntary movement patterns while sparing craniofacial muscle controls.

Final Answer: The projection is Corticospinal fibers.

Answer: (B)

Go Back to Question 7

Q8.

Solution

Concept:

The brain contains interconnected chambers that circulate fluid generated by vascular plexuses. This fluid moves through specific narrow channels before entering the wider protective spaces around the brain. Obstructions in these narrow points cause fluid backup and pressure issues within distinct brain regions.

Solution:

(a) The third ventricle sits in the center of the diencephalon, while the fourth ventricle is located lower down, behind the pons.

(b) The narrow channel linking these two spaces is the cerebral aqueduct, which runs completely through the midbrain structure.

(c) A blockage in this channel stops fluid from exiting, causing high pressure and swelling in the upstream lateral and third ventricles.

(d) The diencephalon forms the walls of the third ventricle but does not contain the narrow connecting aqueduct itself.

(e) The pons and medulla sit below this point, forming the floor of the fourth ventricle rather than enclosing the aqueduct channel.

Final Answer: The division is Midbrain.

Answer: (B)

Go Back to Question 8

Q9.

Solution

Concept:

Weber's syndrome is a classic brainstem stroke resulting from an occlusion of the paramedian branches of the posterior cerebral artery. It presents as an alternating hemiplegia, combining cranial nerve signs on the side of the injury with motor weakness on the opposite side. Locating the damage requires mapping the intersecting motor pathways and nerve roots.

Solution:

(a) This clinical condition involves damage to the anterior part of the midbrain, specifically affecting the crus cerebri area.

(b) The damage disrupts descending corticospinal pathways, causing motor weakness in the limbs on the opposite side of the body.

(c) The injury also hits adjacent exiting fibers of the third cranial nerve, causing oculomotor paralysis on the same side.

(d) The back part of the midbrain contains different pathways, and damage there leads to issues with upward gaze rather than hemiplegia.

(e) Pontine and medullary stroke syndromes affect different cranial nerves, such as the sixth, seventh, or ninth nerves, rather than the third.

Final Answer: The portion is Ventral crus cerebri of the midbrain.

Answer: (D)

Go Back to Question 9

Q10.

Solution

Concept:

The cerebellum handles movement coordination and balance by processing positional inputs and refining motor signals. Unlike the cerebral hemispheres, which control the opposite side of the body, each cerebellar hemisphere manages coordination on its own side due to how its pathways are routed.

Solution:

(a) The patient has coordination issues on the left side, which points to a structural injury in the left cerebellar hemisphere.

(b) Outgoing pathways from the deep cerebellar nuclei ascend and cross over to the opposite red nucleus and motor cortex.

(c) The motor cortex then sends signals down the main corticospinal tract, which crosses back to the original side in the brainstem.

(d) This double-crossing of pathways ensures that each side of the cerebellum monitors and adjusts movements on that same side.

(e) An injury on the right side would cause coordination issues on the right, as these pathways do not run completely uncrossed.

Final Answer: The option is Left cerebellar hemisphere; tracts exert an ipsilateral influence via double-crossing.

Answer: (A)

Go Back to Question 10

Q11.

Solution

Concept:

The posterior relations of the thyroid gland exhibit close neurovascular intersections that demand anatomical precision during surgical resection. The arterial supply to the inferior poles is intimately associated with the paths of the main phonatory nerves. Understanding these specific spatial relationship patterns is critical to minimize postoperative vocal cords dysfunction during endocrine interventions.

Solution:

(a) During a total thyroidectomy surgery, the inferior thyroid artery must be isolated and ligated to control regional bleeding pathways.

(b) The recurrent laryngeal nerve tracks superiorly within the tracheoesophageal groove, bringing it into a direct crossing path with this specific artery.

(c) Near the lower and posterior aspects of the gland capsule, the nerve may pass anterior, posterior, or interlace between the arterial branches.

(d) Due to this close anatomical proximity, blind clamping or ligation of the inferior thyroid artery easily results in accidental nerve trauma.

(e) Injury to the recurrent laryngeal nerve causes motor failure in the intrinsic laryngeal muscles, presenting clinically as hoarseness or vocal cords paralysis.

Final Answer: The nerve is Recurrent laryngeal nerve.

Answer: (C)

Go Back to Question 11

Q12.

Solution

Concept:

The skull base features specialized bony openings that transmit groups of cranial nerves and vascular channels out of the intracranial vault. A localized fracture through these strategic pathways produces matching clinical signs based on the function of the compressed neural bundles. Mapping the loss of motor and sensory systems reveals the exact structural exit point.

Solution:

(a) The patient demonstrates a combined loss of posterior tongue taste pathways, a compromised pharyngeal reflex, and unilateral shoulder shrugging motor weakness.

(b) This distinct clinical presentation points directly to a pathology localized within the exit paths of the jugular foramen.

(c) The jugular foramen serves as the common bony exit route for three major cranial nerves: the glossopharyngeal, vagus, and accessory nerves.

(d) Sensory fibers for the posterior third of the tongue travel via the glossopharyngeal nerve, while the vagus handles the motor gag pathway.

(e) The spinal accessory nerve provides motor innervation to the sternocleidomastoid and trapezius muscles, which are necessary for normal shoulder shrugging maneuvers.

Final Answer: The nerves are CN IX, CN X, and CN XI.

Answer: (B)

Go Back to Question 12

Q13.

Solution

Concept:

The deep facial spaces communicate through multiple osseous openings that allow neurovascular bundles to cross into different regional cavities. The pterygopalatine fossa functions as a major distribution center behind the maxillary sinus. Recognizing the specific paths linking this area to the eye socket helps clinicians track the spread of deep infections.

Solution:

(a) The pterygopalatine fossa communicates with several surrounding regions, including the nasal cavity, oral cavity, middle cranial fossa, and orbit.

(b) The primary anatomical channel extending directly from the upper aspect of this fossa into the floor of the orbit is the inferior orbital fissure.

(c) Maxillary nerve branches and infraorbital vessels utilize this specific fissure line to enter the orbital space from the pterygopalatine area.

(d) Pathological processes, such as deep facial infections or tumors, can track along these neurovascular structures to invade the orbital contents.

(e) The alternative openings serve separate destinations, as the foramen rotundum links back to the middle cranial fossa and the superior fissure joins the orbit to the intracranial space.

Final Answer: The pathway is Inferior orbital fissure.

Answer: (C)

Go Back to Question 13

Q14.

Solution

Concept:

Congenital cardiac malformations typically stem from incomplete or asymmetric structural transformations during early embryonic heart tube partitioning. The separation of the main outflow tract into distinct systemic and pulmonary channels relies on specialized tissue migrations. Deviations in this process alter normal cardiac flow paths, creating classic structural defects.

Solution:

(a) Tetralogy of Fallot is characterized by four primary signs: a ventricular septal defect, pulmonary stenosis, an overriding aorta, and right ventricular hypertrophy.

(b) The root cause of this congenital anomaly is the unequal division of the embryonic truncus arteriosus and conus cordis sections.

(c) This malalignment occurs when the truncoconal septum undergoes a pathological anterior and rightward displacement during the developmental cycle.

(d) The displacement narrows the pulmonary outflow tract while leaving a large gap in the membranous portion of the interventricular partition.

(e) The shifted septum also forces the aortic root to sit directly over the septal defect, receiving blood from both ventricles.

Final Answer: The structure is Truncoconal (aorticopulmonary) septum.

Answer: (C)

Go Back to Question 14

Q15.

Solution

Concept:

Midline neck anomalies in pediatric populations are frequently related to remnant tissue pathways left behind during the migration of endocrine glands. The primordial tissues of the thyroid gland form near the developing tongue before descending to their final pretracheal position. Incomplete closure of this path leaves structural remnants that move dynamically with swallowing.

Solution:

(a) The clinical scenario describes a classic thyroglossal duct cyst, presenting as a mobile midline mass situated close to the hyoid bone structures.

(b) The thyroid gland originates as an endodermal proliferation at the base of the pharynx, a site marked by the foramen caecum.

(c) During normal development, the tissue descends through the neck along a pathway known explicitly as the thyroglossal duct.

(d) This migration pathway loops close to the developing hyoid bone before reaching its final destination in the lower neck.

(e) If parts of this epithelial duct fail to close completely, secretions accumulate within the persistent space to form a midline cyst.

Final Answer: The location is Foramen caecum of the developing tongue.

Answer: (B)

Go Back to Question 15

Q16.

Solution

Concept:

The wall of the gastrointestinal tract shares a common four-layer architecture, but specific regions display distinct structural modifications that match their specialized physiological roles. Microscopic differentiation relies on identifying the types of surface epithelium, mucosal folds, and specific submucosal glandular components. Noting the absence of unique regional features helps identify the tissue source.

Solution:

(a) The biopsy sample displays simple columnar epithelium with interspersed goblet cells and deep mucosal invaginations forming the crypts of Lieberkühn.

(b) The complete absence of mucosal villi rules out small intestine sections, such as the duodenum, jejunum, or ileum tissues.

(c) Villi are essential adaptations for nutrient absorption restricted to small bowel loops, whereas the large intestine features a flat mucosal surface.

(d) The absence of alkaline-secreting submucosal Brunner's glands further rules out a duodenal origin for this specific tissue specimen.

(e) These collective histological findings align with the large intestine, where the colon presents deep crypts rich in goblet cells for lubrication.

Final Answer: The source is Colon.

Answer: (D)

Go Back to Question 16

Q17.

Solution

Concept:

Skeletal muscle fibers possess a highly organized internal framework of myofilaments that create a regular pattern of alternating light and dark bands under microscopic evaluation. The regular alignment of actin and myosin filaments forms repetitive microstructural units along the length of the cell. These units represent the basic functional blocks of muscular contraction.

Solution:

(a) A myofibril contains repeating structural units known as sarcomeres, which serve as the basic contractile blocks of skeletal muscle tissue.

(b) Under high magnification, a single sarcomere is bounded on each side by dark transverse bands called the Z lines.

(c) The Z lines anchor the thin actin filaments, which extend inward toward the center of the contractile unit from both borders.

(d) The center of the sarcomere contains the dark A band, which is formed by thick myosin filaments overlapping with thin actin strands.

(e) During muscle contraction, the distance between consecutive Z lines shortens as thin filaments slide past thick filaments toward the midline.

Final Answer: The landmarks are Z lines.

Answer: (C)

Go Back to Question 17

Answer Key

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