

GPLUS EDUCATION

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BIOLOGY

LOCOMOTION AND MOVEMENT

Single Correct Answer Type

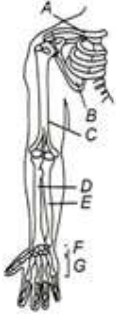
- Volkman's canal occurs in
 - Bone
 - Cartilage
 - liver
 - internal ear
- Scapula is a large triangular flat bone situated in the dorsal part of the thorax between the
 - second and fifth ribs
 - Second and seventh ribs
 - third and eighth ribs
 - fourth and seventh ribs
- The coxal of the pelvic girdle is formed by the fusion of
 - ilium, ischium and pubis
 - scapula and clavicle
 - ilium and scapula
 - ilium, scapula and ischium
- The polysaccharide portion of a proteoglycan present in the matrix of cartilage is known as
 - Ossein
 - Cartilin
 - Casein
 - Chondroitin
- Statements about the mechanism of muscle contraction are given below.
 - Acetylcholine is released when the neural signal reaches the motor end plate.
 - Muscle contraction is initiated by a signal sent by CNS *via* a sensory neuron.
 - During muscle contraction isotropic band gets elongated.
 - Repeated activation of the muscles can lead to lactic acid accumulation.Identify the correct statement.
 - I and IV are correct
 - I and III are correct
 - II and III are correct
 - I, II, and III are correct
- Human skeletal system consists of
 - 200 bones
 - 300 bones
 - 206 bones
 - 250 bones
- Volkman's canals occur in
 - Internal ear
 - liver
 - Cartilage
 - Bone
- Where did an epidemic bone softening disease itai-itai occurred first?
 - South Korea
 - Japan
 - China
 - Burma
- The store house of calcium ions in the muscle fibre is
 - Smooth endoplasmic reticulum
 - Golgi body
 - Sarcoplasmic reticulum
 - Lysosomes
- Ca^{2+} bind ...A... in skeletal muscles and leads to the exposure of binding site for ...B... on the filament ...C... Identify A, B and C, so as to complete the given statements
 - A-troponin, B-actin, C-relaxin
 - A-actin, B-myosin, C-troponin
 - A-troponin, B-myosin, C-actin
 - A-tropomyosin, B-myosin, C-actin
- During skeletal muscle contraction following events occur-
 - I-band shortens
 - A-band shortens
 - H-zone shortens
 - Sarcomere contract
 - ATP changes to ADP and PiChoose the option with incorrect events
 - Only I
 - Only III
 - IV and V
 - Only II

I. ilium II. Incus
 III. ischium IV. pubis

Choose the correct option containing all correct bones

- a) I, II and III b) II, III, and IV c) I, III and IV d) I, II and IV
25.acts as a shock absorber to cushion when tibia
 And femur came together
 a) Ligament b) Cartilage c) Tendon d) Disc
26. Ligament connects
 a) Bone to bone b) Bone to muscle c) Muscle to muscle d) Both (b) and (c)
27. Choose the correct statements regarding muscle proteins
 I. Actin is a thin filament and made up of two F-actins
 II. The complex protein, tropomyosin is distributed at regular intervals of troponin
 III. Myosin is a thick filament which is not a polymerized protein
 IV. The globular head of meromyosin consists of Light Meromyosin (LMM)
 Option containing correct statement is
 a) I, II and III b) I, II and IV c) Only I d) II and IV
28. Folding and unfolding of actin and myosin leads to amoeboid movement. This is hypothesized by
 a) Allen b) Goldacre and Lasch c) Berthold d) Jennigs
29. In the centre of each I-band there is an elastic fibre called
 a) I-line
 b) Z-line
 c) A-line
 d) H-zone
30. Fibrous joints in humans
 a) Allows any movement b) Allows little movement
 c) Don't allow any movement d) None of the above
31. Which ribs show 'bucket-handle' type of movement?
 a) Rib no. 1-2 b) Rib no.3-5 c) Rib no. 6-10 d) Rib no. 11-12
32. Intercalated disc is found in
 a) Muscles of heart b) Vertebrae c) Muscles of legs d) Pubic symphysis
33. Acoelus vertebrae in frog is
 a) 5th vertebrae b) Atlas vertebrae c) 8th vertebrae d) None of these
34. Which one of the following is not a part of ear ossicles?
 a) Malleus b) Incus c) Stapes d) Elium
35. Knee joint is
 a) Cartilaginous b) Fibrous c) Gliding joint d) Synovial
36. The set of ions necessary for muscle contraction is
 a) Ca²⁺ and Mg²⁺ b) Na⁺ and Mg²⁺ c) Na⁺ and K⁺ d) Na⁺ and Ca²⁺
37. Gout is a disease that affects the joints and leads to arthritis. It is associated with an abnormality of
 a) Pyrimidine metabolism b) Purine metabolism
 c) Fat metabolism d) Protein metabolism
38. Sigmoid notch is formed by
 a) Cavity formed by humerus b) Cavity formed by radio-ulna
 c) Cavity formed by tibio-fibula d) Cavity formed by femur
39. The longest bone of the human body is
 a) Humerus b) Tibia c) Vertebra d) Femur
40. Axis vertebra is identified by
 a) Sigmoid notch b) Deltoid ridge c) Odontoid process d) Centrum
41. Total number of bones found in right upper limb is
 a) 25 b) 26 c) 30 d) 60

68. The sensation of fatigue in the muscles after prolonged strenuous physical work, is caused by
 a) a decrease in the supply of oxygen b) minor wear and tear of muscle fibers
 c) the depletion of glucose d) the accumulation of lactic acid
69. Visceral muscles are also called
 a) Smooth muscles b) Non-striated muscles
 c) Involuntary muscles d) All of these
70. Given diagram shows the right pectoral girdle and upper arm (frontal view) of human female Identify A to G and choose the correct option



- a) A-1st Vertebra, B-Scapula, C-Humerus, D-Radius, E-Ulna, F-Carpals, G-Metacarpals
 b) A-Scapula, B-Clavicle, C-Humerus, D-Radius, E-Ulna, F-Carpals, G-Metacarpal
 c) A-Ilium, B-Scapula, C-Humerus, D-Radius, E-Ulna, F-Carpals, G-Metacarpals
 d) A-Clavicle, B-Scapula, C-Humerus, D-Radius, E-Ulna, F-Carpals, G-Metacarpals
71. Identify A, B and C in the given diagram and choose the correct option



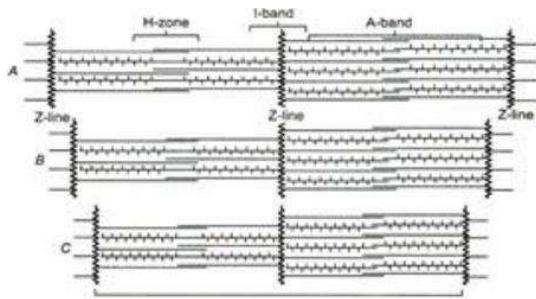
- a) A-Cervical vertebrae, B-Coccyx, C-Sacrum b) A-Cervical vertebrae, B-Coccyx, C-Atlas
 c) A-Cervical vertebrae, B-Coccyx, C-Axis d) A-Cervical vertebrae, B-Sacrum, C-Coccyx
72. Movement of our limbs, jaws, tongue, etc., requires
 a) Ciliary movement b) Amoeboid movement c) Muscular movement d) Flagellar movement
73. Tick the wrong option regarding human beings
 a) Cranial bones-12 b) Facial bones-14 c) Mandible bones-1 d) Zygomatic bones-2
74. Cross arms of the myosin monomer consists of
 a) Outward projection of G-actin filament
 b) Outward projection of the head region of meromyosin
 c) Outward projection of the tail region of meromyosin
 d) Both (b) and (c)
75. Which of the following option shows correct order of some stages of muscle contraction from the beginning to the end of the process?
 a) stimuli → Neurotransmitter secretion → Release of Ca^{2+} → Cross bridges formation → Excitation of T-system → Sliding of action filaments
 b) Stimuli → Neurotransmitter secretion → Excitation of T-system → Release of Ca^{2+} → Cross bridges formation → Sliding of actin filaments → 'H' band diminishes
 c) Stimuli → Excitation of T-system → Neurotransmitter secretion → Cross bridges formation → sliding of action filaments → 'H' band diminishes

- d) Stimuli → Neurotransmitter secretion → Cross bridges formation → Excitation of T-system → Sliding of action filaments
76. Fused vertebrae in human are
 I. Sacral
 II. Coccygeal
 III. Thoracic
 IV. Cervical
 V. Lumber
 a) I and II b) III and IV c) IV and V d) II and V
77. Which of the following statements are false regarding the muscle structure?
 I. In the centre of each I-band is an elastic fibre (Z-line) which bisects it
 II. Thin filament are firmly attached to the Z-line
 III. M-line is a fibrous membrane in the middle of A-band
 IV. A sarcomere comprises one full-A band and two half I-bands
 a) I and II
 b) III and IV
 c) II and III
 d) None of these
78. Which of the following lubricates ligament or tendons and is an important constituent of synovial fluid of bones?
 a) Pectins b) Lipids c) Hyaluronidase d) Hyaluronic acid
79. Troponin is a
 a) Digestive enzyme b) Muscle protein
 c) High energy reservoir d) Water soluble vitamin
80. Nucleus pulposus is found in
 a) Brain b) Nucleus c) Intervertebral disc d) Liver
81. Colle's fracture is associated with
 a) Femur b) Ulna c) Humerus d) Radius
82. For how long, contraction of the muscles continues in sliding filament theory?
 a) Till ATP binds to myosin head b) Till ADP binds to myosin head
 c) Till Ca^{2+} present in sarcoplasm d) Till polymerization of myosin head is going on
83. Osteoporosis is a
 a) Age related disorder b) Gene related disorder
 c) Viral disease d) Bacterial disease
84. Which statement is correct for muscle contraction?
 a) Length of H-zone is decreased b) Length of A-band remains constant
 c) Length of I-band gets increased d) Length of two Z-line get increased
85. The membrane sarcolemma is found over
 a) Heart b) Muscle fiber c) Both (a) and (b) d) Nerve fiber
86. Human vertebral column is formed by
 a) 21 vertebrae b) 30 vertebrae c) 26 vertebrae d) 33 vertebrae
87. The lactic acid generated during muscle contraction is converted to glycogen in
 a) Muscles b) Kidney c) Pancreas d) Liver
88. Which of the following is important for muscle contraction and nerve impulse transmission?
 a) Ca^{2+} ions b) Mg^{2+} ions c) Mn^{2+} ions d) Fe^{2+} ions
89. Which of the following statements is true with reference to the structure of a muscle fibre?
 a) H-zone is present in the middle of A-band
 b) A-band is present in the middle of sarcomere
 c) M-line is present in the middle of H-zone
 d) All of the above

90. Striated appearance of the myofibrils is due to
a) Actin proteins b) Myosin proteins c) Both (a) and (b) d) None of these
91. Latissimus dorsi muscles are
a) Muscles of fore arm b) Muscles of lower jaw
c) Muscles of chest d) Muscles of shoulder
92. A disease associated with joint is humans
a) Glaucoma b) Arthritis c) Hernia d) Horner's syndrome
93. Standing on tip toe is an example of
a) Elevation b) Flexion c) Extension d) Retraction
94. An acromian process is characteristically found in the
a) Pelvic girdle of mammals b) Skull of frog
c) Pectoral girdle of mammals d) Sperm of mammals
95. Which of the below given bones divide olfactory capsules in rebbit into left and right halves?
I. Nasals
II. Premaxillae
III. Maxillae
IV. Mesethmoid
a) I b) IV c) II d) III
96. The muscle band that remains unchanged during contraction and relaxation of the skeletal muscle is
a) I b) H c) A d) A-line
97. Which of the following statements about the joints of humans is false?
a) Joints are essential for all types of movements involving bony parts
b) Joints are the contact between bones or between bones and cartilages
c) Fibrous joints are immovable
d) Cartilaginous joints permits great movement
98. Each actin (thin filament) of is made up of
a) Two 'F' (filamentous) actins b) Two filament tropomyosin
c) Tropin d) All of the above
99. Choose the correct statements
a) Synovial joints are freely movable
b) Ball and socket, and hinge joints are the synovial joints
c) Synovial joints are characterized by synovial cavity with fluid between the articulating surface of the two bones
d) All of the above
100. Select the correct statement with reference to muscle structure
I. Each myosin is a polymerized protein
II. Many meromyosin constitutes one thick filament (myosin)
III. Each meromyosin's tail is called heavy meromyosin (HMM) and head is called light meromyosin (LMM)
IV. The globular head is an active ATPase enzyme and has binding sites for ATP and active sites for actin
Choose the option with correct statements
a) All except I and II b) All except III and IV c) All except III d) All except I and IV
101. Arrange the following steps of muscle contraction in the sequence of events occurring first
I. Receptor sites on sarcolemma
II. Nerve impulse
III. Release of Ca^{2+}
IV. Acetylcholine release
V. Shortening of sarcomere
VI. Synaptic cleft
VII. Spread of impulse over sarcolemma on T-tubule

The correct option is

- a) II → IV → VI → I → VII → III → V b) II → IV → I → VI → VII → III → V
 c) II → IV → I → VI → VII → V → III d) IV → II → I → VI → VII → V → III
102. The region at the ends of the A-band of two adjoining sarcomeres is called
 a) H-zone b) Z-band c) I-band d) M-zone
103. Intervertebral disc consists of a shock absorber connective tissue known as
 a) Hyaline cartilage b) Elastic cartilage c) Fibro cartilage d) Reticulo cartilage
104. Transverse ligament is found in
 a) Axis b) Atlas c) Sacrum d) Thoracic vertebra
105. The region between two successive Z-lines in a myofibril is
 a) Sarcomere b) Sarcosome c) Fascia d) Anisotropic band
106. Choose the correct statements
 a) Axial skeleton comprises 80 bones b) Skull, vertebral column, sternum and ribs constitutes axial skeleton
 c) Skull have total 22 bones d) All of the above
107. The 'wish bone' or 'merry throught bone' of bird is
 a) Sternum b) Scapula c) Coracoid d) Clavicle
108. Macrophages and leucocytes in blood exhibits
 a) Amoeboid movement b) Ciliary movement c) Muscular movement d) Flagellar movement
109. A cricket player is fast chasing a ball in the field. Which one of the following groups of bones are directly contributing in this movement?
 a) Femur, malleus , tibia, metatarsals b) Pelvis, ulna, patella, tarsals
 c) Sternum, femur, tibia, fibula d) Tarsals, femur, metatarsals, tibia
110. Pelvic girdle of rabbit consists of
 a) Ilium, ischium and pubis b) Ilium, ischium and coracoids
 c) Coracoid, scapula and clavicle d) Ilium, coracoid and scapula
111. Ilium, ischium, pubis are the
 a) Cervical vertebrae b) Pectoral bones c) Coaxal bones d) Thoracic bones
112. Low level of Ca^{2+} ions in muscles result in
 a) Rapid spasms b) Wild contractions c) Both (a) or (b) d) None of the above
113. In a vertebrate, which germ layer forms the skeleton muscles?
 a) Ectoderm b) Endoderm c) Mesoderm d) Both (a) and (c)
114. Muscle is attached to bone by
 a) Tendon b) Ligament c) Insertion d) Cartilage
115. Which of the following pairs is correctly matched?
 a) Cartilaginous joint- skull bones
 b) Hinge joint- Between vertebrae
 c) Fibrous joint- Between phalanges
 d) Gliding joint- Between zygapophyses of the successive vertebrae
116. Choose the correct properties of muscle fibres
 I. Muscle fibre is lined by the plasma membrane called sarcolemma
 II. Cytoplasm of the muscle fibre is called protoplasm
 III. Sarcolemma of the muscle fibre encloses the sarcoplasm
 IV. Muscle fibre is syncitium
 Select the correct option
 a) All except II b) All except I c) All except III d) All except IV
117. Identify the state of sarcomere in the diagram and choose the correct option accordingly



- a) A-Contracting, B-Relaxed, C-Maximally contracted
 b) A-Maximally contracted, B-Contracting, C-Relaxed
 c) A-Relaxed, B-Contracting, C-Maximally contracted
 d) A-Relaxed, B-Maximally contracted, C-Contracting
118. In *Paramecium*, cilia helps in
 a) Movement of cytopharynx
 b) Locomotion
 c) Both (a) and (b)
 d) Reproduction
119. What will happen if ligaments are cut or broken?
 a) Bones will move freely at joints
 b) No movement at joint
 c) Bone will become unfixed
 d) Bone will become fixed
120. This joint is made for power
 a) Joint between vertebrae
 b) Mandibular joint
 c) Knee joint
 d) Suture in cranium
121. Slow muscle fibres are found in
 a) Eye
 b) Leg
 c) Stomach
 d) Heart
122. Decreased level of oestrogen in human body leads to
 a) Myasthenia gravis
 b) Muscular dystrophy
 c) Osteoporosis
 d) Gout
123. Sarcomere is a
 a) Functional unit of contraction
 b) Portion of myofibril present in between two M-lines
 c) Complete bundle of muscles
 d) Portion of myofibril present in between two A-bands
124. I-bands of myofibrils are bisected by
 a) A-bands
 b) H-zone
 c) Z-lines
 d) M-lines
125. In which of the following, growth is possible through increase in volume?
 a) Cartilage
 b) Striated muscle
 c) Nerve fiber
 d) Lens of eye
126. First vertebrae in human is called
 a) Axis
 b) Atlas
 c) Lumbar
 d) Cervical
127. Consider the following statements.
 VI. In man, vertebral column has 33 bones organized as 28 bones.
 VII. Pelvic girdle is made up of two fused bones only.
 VIII. Osteoporosis is characterized by micro-architectural deterioration of the bone.
 a) I is correct
 b) II is correct
 c) III is correct
 d) I is incorrect
128. Bones of the limbs along with their girdles constitutes the
 a) Appendicular skeleton
 b) Axial skeleton
 c) Apex skeleton
 d) Axis skeleton
129. *Hydra* can use its tentacles for
 a) Capturing its prey
 b) Locomotion
 c) Digestion
 d) Both (a) and (b)
130. Which one of the following is wrongly matched?
 a) Myosin-Contractile protein
 b) Tendon- Connective tissue
 c) Smooth muscle- Involuntary muscle
 d) Red muscle- Myoglobin
131. Hinge joint is present between
 a) Humerus and ulna
 b) Femur and pectoral girdle

- c) Humerus and pelvic girdle
 d) All of the above
132. In the body, the membrane surrounding the bone is known as
 a) Periosteum b) Endosteum c) Perichondrium d) Chondrocytes
133. Which of the following is a part of pectoral girdle?
 a) Ilium b) Ischium c) Acetabulum d) Glenoid cavity
134. The joint of femur, with pelvic girdle is
 a) Hinge joint b) Pivot joint
 c) Non-movable joint d) Ball and socket joint
135. Which one is wrongly matched?
 a) Tendon – Connective tissue b) Smooth muscle – Involuntary muscle
 c) Red muscle – Myoglobin d) Troponin – Fibrous protein

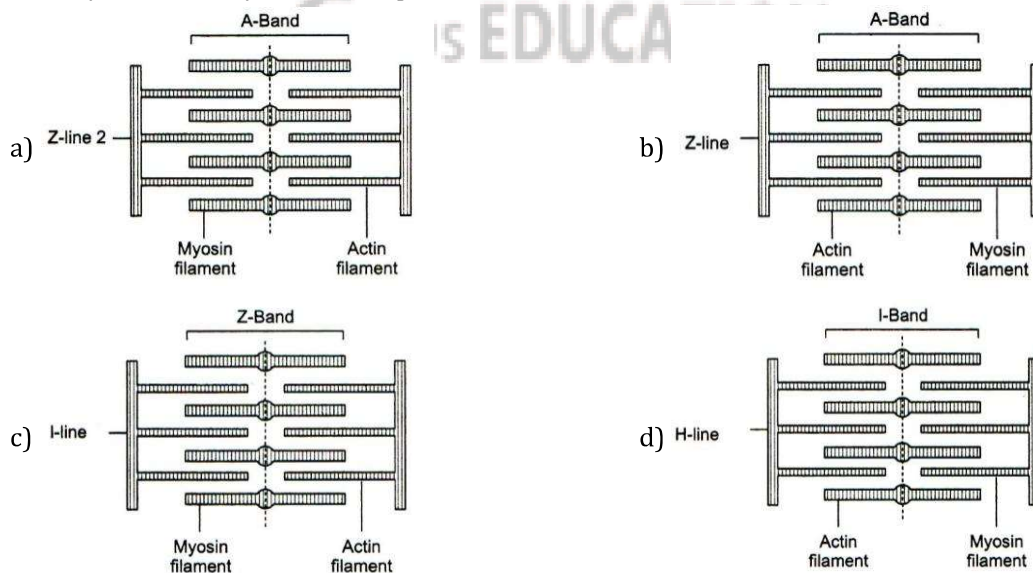
136. Which of the following statements are wrong with reference to muscles?

- I. Cardiac fibres are branched with one or more nuclei
 II. Smooth muscles are unbranched and cylindrical
 III. Striated muscles never performs anaerobic respiration
 IV. Cardiac muscles are non-striated

Correct option with all wrong statements is-

- a) II and III b) I and IV c) III and IV d) I and III
137. Cytoplasmic streaming movement is the characteristic of
 a) Prokaryotes b) Eukaryotes c) Virus d) All of these

138. Olecranon fossa is present over
 a) Scapula b) Ulna c) Radius d) Humerus
139. In which of the following condition, progressive degeneration of skeletal muscles happens?
 a) Myasthenia gravis b) Muscular dystrophy c) Tetany d) Arthritis
140. Gout happens due to accumulation of is joints
 a) Glucose crystals b) Uric acid crystals c) Urea crystals d) Ammonia crystals
141. Identify the correctly labeled diagram

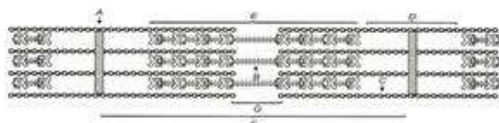


142. Number of tarsals, metatarsals and phalanges in human skeleton is
 a) 7,5,14 b) 8,5,14 c) 9,5,14 d) 5,6,7
143. Human skull is
 a) Monocondylic b) Dicondylic c) Procoelous d) Heterocoelous
144. In the thin filament of skeletal muscle fibre, a small globular protein that masks the active sites on the F-actin L, is
 a) G-actin b) Actin c) Tropomyosin d) Troponin
145. Haversian canal is found in the bone of

- a) Mammals b) Reptiles c) Aves d) Pisces
146. Identify the synovial joints among the given articles
 I. Ball and socket
 II. Hinge joint
 III. Pivot joints
 IV. Sutures of skull
 V. Vertebral joints
 Select the option containing correct articles
 a) I, II, III and IV b) I, III, IV and V c) II, III, IV and V d) I, II and III
147. Atlas and axis are joined by
 a) Hinge joint b) Pivot joint c) Saddle joint d) None of these
148. The number of cervical vertebrae present in giraffe is
 a) 14 b) 5 c) 4 d) 12
149. Each myofibrils of muscles contains
 a) Regular dark bands b) Regular light bands
 c) Both (a) and (b) d) Alternate dark and light bands
150. Functional unit of skeletal muscle is called
 a) Sarcomere b) Twitch c) Z-band d) None of these
151. Globular head with a short arm and a tail are the two imperfect part of
 a) F-actin b) G-actin c) Tropomyosin d) Meromyosin
152. In rabbit, end of a long bone is connected to another by
 a) Tendon b) ligaments c) Muscle d) Cartilage
153. Synsacrum of fowl consists of about
 a) 29 vertebrae b) 3 vertebrae c) 16 vertebrae d) Single vertebrae
154. Actin and myosin filaments of muscles are also called
 a) Thick and thin filaments respectively
 b) Thin and thick filaments respectively
 c) Black and white filaments respectively
 d) White and black filaments respectively
155. A sarcomere in the myofibrils of muscle is found in between
 a) 2 M-lines
 b) 2 Z-lines
 c) 2 H-lines
 d) 2 A-bands
156. Identify the muscle which represents the following characteristics and choose the correct option accordingly
 I. Transportation of food through the digestive tract
 II. Transportation of gametes through the genital tract
 a) Skeletal muscles b) Visceral muscles c) Cardiac muscles d) Striated muscles
157. Middle ear contains three tiny bones
 I. Maxillae II. Malleus
 III. Incus IV. Stapes
 V. Vomer
 a) I, II and III b) II, III and IV c) III, IV and V d) I, II and V
158. I. Myoglobin in very less quantity
 II. Appear pale or whitish
 III. Mitochondria are very few
 IV. Sarcoplasmic reticulum in large quantity
 Given characteristics of muscles fibres be long to
 a) White fibres b) Green fibres c) Red fibres d) Pink fibres

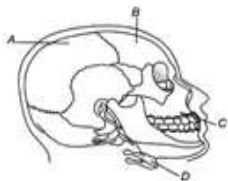
159. Which ion binds with troponin during muscle contraction?
 a) HCO_3^- b) Ca^{2+} c) Cl^- d) Na^+
160. Muscle contraction is initiated by the signal sent by
 a) CNS b) PNS
 c) ANS d) Neutral transmitters
161. Haversian canals are found in
 a) Internal ear of mammal b) External ear of mammal
 c) Long bone of rabbit d) Spinal cord
162. What is the purpose of locomotion performed by animals?
 I. Search of food
 II. Search of shelter
 III. Search of mate
 IV. Search of suitable breeding grounds
 V. Search of favourable climate conditions
 VI. Escaping from enemies/predators
 Choose the correct option
 a) All except V b) All except IV c) All except II d) All of these
163. Flat bone on the ventral midline of thorax is called
 a) Coccyx b) Sternum c) Sacrum d) Ribs
164. Which muscle component is the smallest among the given options?
 a) Muscle fibre b) Myofibril c) Actin d) Sarcomere
165. Choose the wrongly matched option
 a) Frontal bone-1 b) Parietal bones-2 c) Temporal bone-1 d) Sphenoid bone-1
166. Cartilage has slightly pliable matrix due to
 a) Chondroitin salts b) Osteoblast c) Chondroclast d) Osteoclast
167. In humans, true ribs connects to ...A... and ...B... dorsally and ventealiy respectively
Dorsally to Ventrally to
 a) Sternum Vertebral column b) Sternum Stapes
 c) Vertebral column Sternum d) Vertebral column Incus
168. Myofilaments or myofibrils are
 a) Obliquely arranged filaments of muscle fibre b) Parallely arranged filaments of muscle fibre
 c) Horizontally arranged filaments of muscle fibre d) Radially arranged filaments of muscle fibre
169. Select the correct statements with reference to muscles
 I. Cardiac muscles are non-striated
 II. All non-striated muscles are involuntary
 III. All movements leads to locomotion
 IV. Micro filaments all involved in amoeboid movements
 Correct option with all wrong statements is-
 a) I and III b) I and II c) III and IV d) II and IV
170. Ciliary movement occurs in most of our internal tubular organs which are lined by ...A epithelium. The coordinated movement of cilia in the ...B... help us in removing dust particles. Passage of ova through female reproductive tract is facilitated by the ...C... movement
 Identify A, B and C to complete the given NCERT statement
 a) A-squamous, B-trachea, C-ciliary b) A-cuboidal, B-trachea, C-ciliary
 c) A-ciliated B-trachea, C-amoeboid d) A-stratified, B-trachea, C-amoeboid
171. The clavicle articulates with.....of scapula.
 a) Acromion process b) Glenoid cavity
 c) Acetabulum cavity d) Ball and socket joint
172. Elbow joint is an example of
 a) Pivot joint b) Hinge joint c) Gliding joint d) Ball and socket joint

173. The thin filaments of a muscle fiber are made up of
 a) Actin, troponin, tropomyosin
 b) Actin, troponin
 c) Myosin, troponin
 d) Actin, tropomyosin
174. Motor unit is a
 a) Neuron
 b) Muscle fibre
 c) Motor neuron with muscle fibre
 d) All of the above
175. Based on their location in humans body or animals types of muscles are
 I. skeletal II. visceral
 III. cardiac IV. non-visceral
 The correct option is
 a) I and II
 b) II and IV
 c) I, II and III
 d) I, III and IV
176. In which of the following muscle component actin binding sites all present?
 a) Troponin
 b) Tropomyosin
 c) Meromyosin
 d) Troponin and tropomyosin
177. Which one of the following is a skull bone?
 a) Coracoid
 b) Arytenoid
 c) Atlas
 d) Pterygoid
178. Centrum of 8th vertebra of frog is
 a) Procoelous
 b) Acoelous
 c) Amphicoelous
 d) Amphiplatyan
179. Which of the following statements is correct?
 a) Movable skull bone is mandible
 b) We move our hands, while walking for balancing
 c) Cartilaginous joints have little mobility due to fibrocartilage disc between its articular ends, *e. g.*,
 intervertebral disc between the centre of vertebrae
 d) All of the above
180. Identify A-G in the given diagram and choose the correct option with reference to the hints I-VII



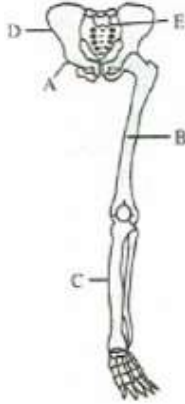
- I. A-band II. I-band
 III. Sarcomere IV. H-zone
 V. Myosin
 VI. Actin, troponin and tropomyosin
 VII. Z-line
 The correct option is
 a) I-E, II-D, III-F, IV-G, V-B, VI-C, VII-A
 b) I-E, II-D, III-C, IV-G, V-B, VI-A, VII-F
 c) I-E, II-D, III-F, IV-G, V-C, VI-C, VII-B
 d) I-E, II-D, III-F, IV-A, V-B, VI-C, VII-G
181. Sensation of fatigue in muscles after prolonged strenuous physical work is caused due to
 a) Decrease in the supply of oxygen
 b) Minor wear and tear of muscle fibres
 c) The depletion of glucose
 d) The accumulation of lactic acid
182. In a ...A... state, the edge of thin filaments on either side of thick filaments ...B... overlap the free ends of ...C... filaments leaving the central part of thick filaments. This central part of thick filament, not overlapped by thin filaments is called ...D... zone.
 Choose the correct options to fill the gaps A, B, C and D, so as to complete the given NCERT statement
 a) A-resting, B-partially, C-thick, D-H
 b) A-resting, B-partially, C-thick, D-A
 c) A-resting, B-partially, C-thick, D-I
 d) A-resting, B-partially, C-thick, D-M
183. Muscle pump is
 a) Beating of heart
 b) Squeezing effect of muscles upon veins running through them
 c) Peristaltic wave that travel along the alimentary canal

- d) None of the above
184. There are seven cervical vertebrae in almost
 a) All vertebrate b) All amphibian c) All reptile d) All mammals
185. Which of the following statements are true for ciliary movements?
 a) They takes part in the propulsion of excretory products
 b) They present in trachea, vasa efferentia and oviducts
 c) They are seen in *Paramecium* and other ciliates
 d) All of the above
186. Synovial joints in humans are characterized by
 a) Joining of two bones b) Presence of fluid filled synovial cavity
 c) Rare movement d) No movement at all
187. What is the approximate number of muscle present in human body?
 a) 21 b) 96 c) 1042 d) 640
188. How many pairs of ribs are present in human skeleton?
 a) 10 pair b) 12 pair c) 9 pair d) 7 pair
189. Identify *A, B, C* and *D* in the given diagram of humans skull. Choose the correct option



- a) A-Hyoid bone, B-Maxilla, C-Frontal bone, D-Parietal bone
 b) A-Hyoid bone, B-Maxilla, C-Parietal bone, D-Frontal bone
 c) A-Maxilla, B-Hyoid bone, C-Parietal bone, D-Frontal bone
 d) A-Parietal bone, B-Frontal bone, C-Maxilla, D-Hyoid bone
190. Monomer of the myosin (thick) filament is
 a) Troponin b) Tropomyosin c) Meromyosin d) F-actin
191. Head of myosin monomer consists of
 I. actin binding sites
 II. ATP binding sites
 III. ADP binding sites
 IV. AMP binding sites
 Select the correct options
 a) I and II b) III and IV c) I and IV d) II and IV
192. The joint of radio-ulna with the upper arm is
 a) hinge joint b) pivot joint c) socket joint d) None of these
193. Sutures of human skull is
 a) Fibrous joint b) Hinge joint c) Synovial joint d) Pivots joint
194. Skeletal system consist of a
 a) Bones and cartilage b) Brain c) Only bones d) Only cartilage
195. The parashenoid bone in frog forms
 a) Base of cranium b) Floor of cranium
 c) Dorsal side of cranium d) Dorsolateral side of cranium
196. Study the following statement
 I. Accumulation of acidic acid in muscles causes fatigue
 II. Accumulation of lactic acid in muscles causes fatigue
 III. Anaerobic respiration takes place in muscles
 IV. Cori cycle occurs in muscles
 Choose the correct set of statements
 a) I, II and III b) II, III and IV c) I, III and IV d) II, III and IV

197. Parts labelled as 'A', 'B', 'C', 'D' and 'E' respectively indicate in the given figure are



A B C D E

- a) ilium femur tibia pubis sacrum
- b) Pubis tibia femur ilium sacrum
- c) ilium femur ilium pubis sacrum
- d) Pubis femur tibia ilium sacrum

198. Contractile fibrils of the muscles are called

- a) Neurofibrils
- b) Collagen fibres
- c) Myofibrils
- d) Yellow fibres

199. I. Ca^{2+} ions pumps back to sarcoplasmic reticulum

II. Z-lines back to their original position

III. Masking of actin filament

IV. Relaxation of muscles

Arrange the above given steps in the sequence of event from first to last

- a) I → II → III → IV
- b) I → III → II → IV
- c) IV → III → II → I
- d) IV → III → I → II

200. Where the troponin is found during muscle contraction?

- a) Myosin filament
- b) Meromyosin
- c) Tropomyosin
- d) T-tubule

201. Read the statements regarding muscle proteins.

IX. Actin is a thin filament and is made up of two F-actins.

X. The complex protein, tropomyosin is distributed at regular intervals of troponin.

XI. Myosin is a thick filament which is also a polymerized protein.

XII. The globular head of meromyosin consists of light meromyosin (LMM).

Which of the above statements are correct?

- a) I,II and III
- b) I, II and IV
- c) I and III
- d) II and IV

202. Which one is odd pair?

- a) Femur-Humerus
- b) Tibia-Radius
- c) Axis-Atlas
- d) Tarsal- Carpals

203. Actin binding sites are located on

- a) Troponin
- b) Tropomyosin
- c) Meromyosin
- d) Both (b) and (c)

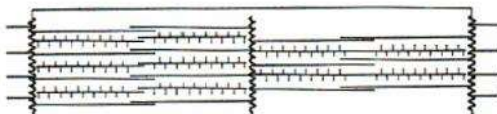
204. Neural canal is present in

- a) Humerus
- b) Tibio-fibula
- c) Vertebral column
- d) Cranial bones

205. Vestigial tail in humans is

- a) Thoracic vertebrae
- b) Lumber vertebrae
- c) Sacral vertebrae
- d) Caudal vertebrae

206. Identify the state of two sarcomeres in the diagram given below

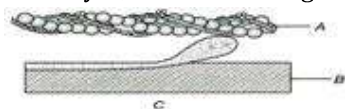


- a) Relaxed state
- b) Contracting state

- c) Fully contracted state
d) Maximally relaxed state
207. Sigmoid notch is present in
a) Femur b) Radius-ulna c) Tibia-fibula d) Humerus
208. Haversian canals are present in
a) Bone marrow b) Hyaline cartilage c) Bone matrix d) Calcified cartilage
209. Each human limb is made of
a) 60 bones b) 50 bones c) 40 bones d) 30 bones
210. Which is common to kidney and skeleton in mammals?
a) Cortex b) Medulla c) Pelvis d) Radius
211. Immediate energy source for muscle contraction is
a) ATP b) ADP c) Glucose d) Lactic acid
212. Which of the following statements about the molecular arrangement of actin and myosin are correct?
I. Each actin (thin filament) is made up of 2F (filamentous) actins
II. F-actin is the polymer of G (globular) actin
III. 2F = actins are twisted into a helix
IV. Two strands of tropomyosin (protein) lies in the grooves of F-actin
The correct option is
a) I and II b) III and IV c) I and IV d) All except IV
213. Arthritis is
a) Inflammation of liver b) Inflammation of joints
c) Degradation of joints d) Inflammation of heart
214. Humerus fits into glenoid cavity is example of
a) Ball and socket joint b) Pivot joint c) Peg and socket joint d) Condylloid joint
215. Ribs attached to sternum are
a) First seven pairs b) All ten ribs c) First ten rib pairs d) First five rib pairs
216. Locomotion requires a perfect coordinated activity of
a) Muscular system b) Skeletal system c) Neural system d) All of these
217. Largest muscle in the human body is
a) Sartorius b) Gluteus c) Stapedius d) Masseter
218. Red fibres are the fibres containing high content of
a) Myoglobin b) Globular protein c) Glycogen d) Anthocyanin
219. An individual sarcomere of myofibril consists of
a) Overlapping actin and myosin b) A stack of actin fibres
c) A stack of myosin units d) Overlapping actin and relaxin
220. During the muscle contraction, which zone decreases?
a) I-zone b) Z-zone c) H-zone d) M-zone
221. Main types of movement exhibited by the cells of human body are
I. Amoeboid II. Ciliary
III. Muscular IV. Flagellar
Option containing the correct answer is
a) I and II b) II and III c) III and IV d) I, II, III and IV
222. Synovial fluid is present in
a) Fibrous joints b) Cartilaginous joints c) Freely movable joints d) Intervertebral joints
223. The gliding joints are important for gliding movements. One example of such a joint is between the
a) Zygapophysis of adjacent vertebrae b) Humerus and glenoid cavity
c) Occipital condyle and odontoid process d) Femur and tibio fibula
224. Which of the following features differentiate bone from cartilage?
a) Haversian canal b) Blood vessel c) Lymph vessel d) All of these
225. End of long bones are covered with

- c) Both (a) and (b)
d) None of the above

241. Pseudopodia in Protozoa is formed by the streaming of
a) Cytoplasm b) Protoplasm c) Cell membrane d) Cell wall
242. Cartilaginous joints in humans
a) Permit any movement b) Permit little movement
c) Permit no movement d) All of these
243. What is the Location of troponin in the process of muscle contraction?
a) Attached to myosin filament b) Attached to tropomyosin
c) Attached to myosin cross bridge d) Attached to T-tubule
244. Fascicles in human/animal are the
a) Blood capillaries b) Muscle bundles c) Intercalated discs d) Muscle cytoplasm
245. Which is not the function of endoskeleton?
a) Sight b) Hearing c) Locomotion d) Production of RBCs
246. Identify A, B and C in the given diagram. Choose the correct option



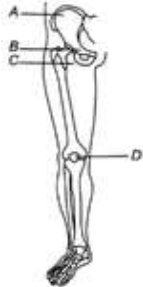
- a) A-Actin filament, B-Myosin filament, C-Breaking of cross bridge
b) A-Myosin filament, B-Myosin filament, C-Breaking of cross bridge
c) A-Myosin filament, B-Actin filament, C-Breaking of cross bridge
d) A-Actin filament, B-G-actin filament, C-Breaking of cross bridge
247. The joint found in head of upper arm and pectoral girdle is
a) Hinge joint b) Ball and socket joint c) Gliding joint d) Saddle joint
248. Study the following sentence .
XIII. The accumulation of pyruvic acid in the muscle causes fatigue
XIV. ATP is resynthesized in the muscle by the phosphorylation of ADP by a phosphogen.
XV. Cori and cori's cycle occurs in the muscles.
XVI. The phosphogen in the vertebrate muscle is arginine phosphate.
The correct set of answers for muscle contraction is
a) I and II b) II and IV c) III and IV d) II and III
249. In procoelous vertebrae,
a) Anterior Centrum is convex b) Anterior Centrum is convex
c) Anterior Centrum is saddle-shaped d) Posterior Centrum is concave
250. Select the wrong set of statements with respect to muscles
I. Z-line is present in the centre of the light band
II. Thin filaments are firmly attached to the M-line
III. The central part of the thick filaments, not overlapped by thin filaments is called Z-band
IV. Light band contains only thin filaments
Correct option with all wrong statements is
a) I and IV b) II and III c) I and III d) II and IV
251. Pick the true statements with reference to human beings
I. Vertebral column consists of 26 vertebrae
II. Vertebral is dorsally placed
III. Neural canal in vertebra is the passage for spinal cord
IV. Neural canal is ventrally placed
The option with all correct statements is
a) II, III and IV b) I, III and IV c) I, II and IV d) I, II and III
252. I. Sarcoplasmic reticulum are abundant
II. Myoglobin content is high

- III. Sarcoplasmic reticulum are moderate
- IV. Aerobic muscles
- V. Depends on anaerobic respiration for energy
- VI. Less myoglobin content

Select the option with correct statements for red muscle

- a) I, II and IV
- b) I, II and III
- c) II, III and IV
- d) II and IV

253. Identify *A, B, C* and *D* in the given diagram. Choose the correct option



- a) A-Ilium, B-Ischium, C-Pubis, D-Patella
- b) A-Ilium, B-Pubis, C-Ischium, D-Patella
- c) A-Ilium, B-Patella, C-Ischium, D-Pubis
- d) A-Ilium, B-Patella, C-Pubis, D-Ischium

254. Rib cage is formed by

- a) Thoracic vertebrae
- b) Ribs
- c) Sternum
- d) All of these

255. The term 'innominate' is related with

- a) Nerve
- b) Artery
- c) Skeleton
- d) None of these

256. Inflammation of joints due to accumulation of uric acid crystals is called as

- a) Gout
- b) Myasthenia gravis
- c) Osteoporosis
- d) Osteomalacia

257. F-actin is a polymer of

- a) G (molecular) actin
- b) G (globular) actin
- c) G (meromyosin) action
- d) All of these

258. For muscle contraction, in myofibrils the formation of a protein is essential, such protein was discovered by

- a) Jean Hanson
- b) Cori and Cori
- c) Albert Szent Gyorgyi
- d) Hugh Huxley

259. Select the incorrect option about the human skull

- a) It has 6 ear ossicles
- b) It includes 14 facial bones
- c) It is dicondylic
- d) Hyoid is included in the skull bone

260. Identify *A, B* and *C* along the given diagram



- a) A-Troponin, B-Tropomyosin, C-Factin
- b) A-Thick filament, B-Troponin, C-Tropomyosin
- c) A-Myosin filament, B-Troponin, C-Tropomyosin
- d) A-Meromyosin, B-Troponin, C-Tropomyosin

261. The glenoid cavity is associated with

- a) Scapula
- b) Humerus
- c) Both (a) and (b)
- d) None of these

262. Hardness of the bones is due to

- a) Hard matrix made up of calcium salts
- b) Soft matrix made up of sodium salts
- c) Hard matrix made up of sodium salts
- d) Soft matrix made up of chondroitin salts

263. Ribs that are attached to the thoracic vertebrate and ventrally connected to the sternum with the help of hyaline cartilage are called

- a) True ribs
- b) False rib
- c) Floating ribs
- d) Rib cage

264. The number of floating ribs in the human body is

- a) 6 pairs
- b) 5 pairs
- c) 3 pairs
- d) 2 pairs

265. Scapula is a triangular bone situated

- a) Dorsal part of thorax between 2nd and 7th ribs
- b) Ventral part of thorax between 2nd and 7th ribs
- c) Medial part of thorax between 2nd and 7th ribs
- d) None of the above

266. Matrix of bone is composed of

- a) Chondrin
- b) Ossein
- c) Osteon
- d) Auxin

267. Relaxation of the muscle takes place due to

- I. pumping of Ca^{2+} ions in sarcoplasmic reticulum
- II. presence of ATP
- III. conformational changes in troponin and masking the actin filament

Option containing correct statement is

- a) I and III
- b) I and II
- c) II and III
- d) I, II and III

268. Which one of the following is a sesamoid bone?

- a) Pelvis
- b) Patella
- c) Pterygoid
- d) Pectoral girdle

269. Identify *A*, *B* and *C* in the given diagram choose the correct option

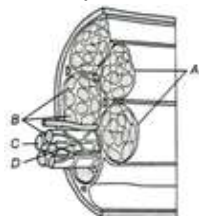


- a) A-Sternum, B-Vertebral column, C-Ribs
- b) A-Ribs, B-Vertebral column, C-Sternum
- c) A-Ribs, B-Sternum, C-Coccyx
- d) A-Sternum, B-Ribs, C-Vertebral column

270. Mechanism of muscle contraction is best explained by

- a) Physical filament theory
- b) Chemical filament theory
- c) Sliding filament theory
- d) Jumping filament theory

271. Identify *A*, *B*, *C* and *D* in the given diagram and choose the correct option



- a) A-Fascicle, B-Muscle fibre, C-Sarcolemma, D-Blood capillary
- b) A-Muscle fibre, B-Fascicle, C-Sarcolemma, D-Blood capillary
- c) A-Muscle fibre, B-Fascicle, C-Sarcoplasm, D-Blood capillary
- d) A-Muscle fibre, B-Endoplasmic reticulum, C-Sarcolemma, D-Blood capillary

272. Identify *A*, *B*, *C* and *D*, in the given diagram and choose the correct option



- a) A-Actin binding site, B-ATP binding site, C-Head, D-Cross arm
- b) A-Actin binding site, B-ATP binding site, C-Head, D-Side arm
- c) A-Actin binding site, B-ATP binding site, C-Head, D-Long arm
- d) A-Actin binding site, B-ATP binding site, C-Head, D-Short arm

273. Choose the correct statement about muscles

- a) Muscles are the specialized tissues of mesodermal origin
- b) About 40-50% of the body weight is contributed by muscles
- c) Muscles have special properties like excitability, contractibility and extensibility
- d) All of the above

274. During muscles contraction

- a) Thick filaments slide over thin filaments b) I-band gets reduced
c) Both (a) and (b) d) None of the above
275. When body part moves towards the median axis the muscle is called
a) Abductor b) Adductor c) Supinator d) Pronator
276. According to the functions the skeletal muscles is/are
a) Antagonists
b) Synergists
c) Prime movers
d) All of these
277. Formula of vertebral column of man is
a) C₄ T₄ L₄ S₈ C₈ b) C₇ T₁₂ L₅ S₁ C₁ c) C₇ T₁₂ L₁ S₅ C₁ d) C₇ T₈ L₅ S₆ C₇
278. Sliding filament theory was given by
a) AF Huxley and T Huxley b) Leeuwenhoek and Hooke
c) AF Huxley and HF Huxley d) HF Huxley and Robert Hooke

