

QB365

Important Questions - Locomotion and Movement

11th Standard CBSE

Biology

Reg.No. :

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Time : 01:00:00 Hrs

Total Marks : 50

Section-A

- 1) Give reason for variation in methods of locomotion. 1
- 2) Which property of muscles is used effectively in muscular movement? 1
- 3) Give an example of cartilaginous joints. 1
- 4) Give the location of ball and socket joint in a human body 1
- 5) What substance is responsible for lubricating the freely movable joint at the shoulder 1
- 6) How many total bones are there in human body? Name the largest and strongest bone 1
- 7) Give the name of the cavity in the girdle to which head of femur articulates 1
- 8) Name the pigment concerned with storage of oxygen in vertebrate muscles? 1
- 9) Which bones help in hearing? Where are they found? 1
- 10) Sarcolemma, sarcoplasm and sarcoplasmic reticulum refer to a particular type of cell in our body. Which is this cell and to what parts of that cell do these names refer to? 1

Section-B

- 11) The human endoskeleton consists of two parts. Name them with a number of bones in each. 2
- 12) Name the joint, present between the vertebrae in the vertebral column. Also write in brief about the joint. 2
- 13) Which tissue is affected by Myasthenia gravis? What is the underlying cause? 2
- 14) What kind of muscle fibres are richly found in the extensor muscles of the back? 2
What characteristics enable these fibres to serve their purpose?
- 15) Give function of a sternum. 2
- 16) Why do muscles fatigue? 2
- 17) How can a red muscle fibre work for prolonged period? 2
- 18) What is gout arthritis? 2
- 19) Write a few lines about gout 2
- 20) Describe the important steps in muscle contraction. 2

Section-C

- 21) Why are muscles rigidly locked in whatever position they are after death? What is the phenomenon known as? 5
- 22) Give the name of the major parts of human skeleton. Also mention the number of bones in each part. 5
- 23) Differentiate between pectoral and pelvic girdle 5

- 24) (i) How does a muscle return to its original form during relaxation? Also draw a diagram showing relaxation of muscle. 5
- (ii) What causes muscle fatigue?

Section-A

- 1) Methods of locomotion vary with animal's habitat and demand of situation. 1
- 2) Contractile property of muscles. 1
- 3) The joint between the adjacent vertebrae of vertebral column. 1
- 4) Shoulder joint (between pectoral girdle and head of humerus). 1
- 5) Synovial fluid 1
- 6) Human body contains 206 bones. Femur is the largest and strongest bone of human body. 1
- 7) Acetabulum 1
- 8) Myoglobin 1
- 9) Malleus, incus and stapes. These are found in internal ear. 1
- 10) The cell is muscle. 1

These names refer to the following parts

Sarcolemma -Plasma membrane

Sarcoplasm -Cytoplasm

Sarcoplasmic reticulum -Endoplasmic reticulum

Section-B

- 11) Two parts of human endoskeleton are as follows 2
 - (i) Axial skeleton, it comprises of 80 bones.
 - (ii) Appendicular skeleton, it comprises of 1260 bones.
- 12) 2

The cartilaginous joint is present in between the vertebrae. It allows slight movement because of the elastic pads of fibrocartilage present between the ends of bones taking part in the joints.
- 13) 2

Myasthenia gravis affected the skeletal muscles of the body.

It is caused due to chronic autoimmune neuromuscular disease characterised by varying degree of weakness in the skeletal muscles.
- 14) Red striated muscle fibres. 2

Their abundant myoglobin and mitochondria enable them to serve their purpose.
- 15) 2

The sternum is a flat dagger-shaped bone located on the ventral midline of the thorax. Ribs bones attach themselves to the sternum in the front.

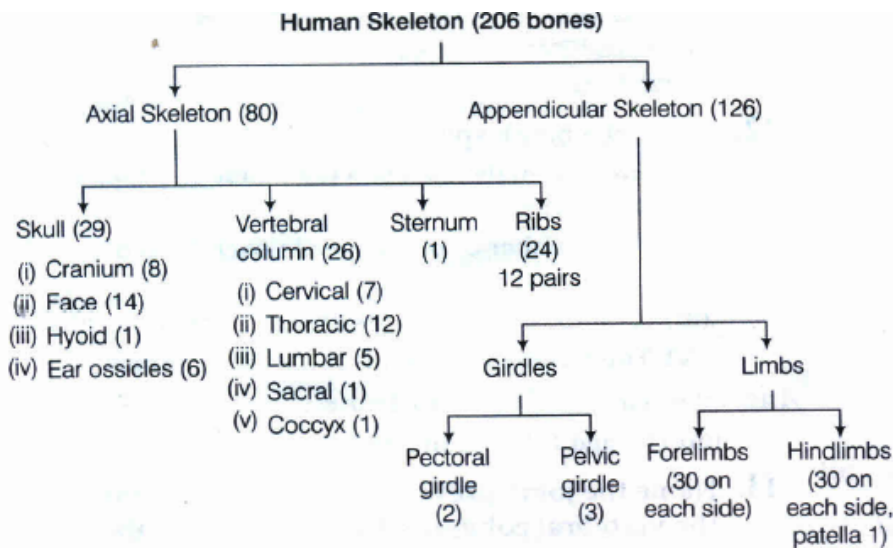
- 16) 2
The continuous contraction and relaxation in muscles cause movement in organs. If it continues for a longer time then conditions are created in muscle cells and anaerobic respiration begins due to which lactic acid is formed. Thus, accumulation of lactic acid causes muscle fatigue. After taking some rest in some course of time liver degrades the lactic acid and person is relieved from pain.
- 17) 2
The red muscle fibre has a reservoir of oxygen in the form of myoglobin. The anaerobic conditions are not created soon. This avoids muscle fatigue.
- 18) 2
When excess of uric acid crystals gets accumulated in the joints like ankle, knee, etc., they cause pain. This is called gout arthritis.
- 19) 2
When metabolic waste like uric and urate crystals are present in excess in blood, they get accumulated in the joints causing gout or gouty arthritis. It is very painful, particularly at night and makes movement difficult.
- 20) 2
Summary of steps in skeletal muscle contraction
- (i) **Stimulation**
- (a) Nerve impulse arrives at neuromuscular junction and release of acetylcholine takes place.
 - (b) Spreading of action potential through muscle fibre.
 - (c) The release of Ca^{2+} from sarcoplasmic reticulum to cytoplasm of muscle fibre.
- (ii) **Contraction**
- (a) ATP joins to myosin head that hydrolyses into ADP and P_i releasing energy, which in turn raises the head to high energy state (the head joins active site on actin, forming cross-bridge).
 - (b) ADP and P_i are released. And head returns to low energy state.
 - (c) Actin filament is thus, pulled towards center of sarcomere. And a new ATP joins head, detaching it from actin filament.
 - (d) Above mentioned steps are thus, repeated many times during one contraction to draw the thin myofilaments further inward.

Section-C

- 21) 5
Muscles require ATP to relax as well as to contract. On animal's death, its muscles soon exhaust ATP and lose the ability to contract or relax. They become rigidly locked in whatever position they were when ATP gets completely used up. This phenomenon is known as Rigor Mortis. It is used in determining the time of death.

22)

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23)

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Pectoral and pelvic girdle help in the articulation of upper and lower limbs, respectively. Each girdle is made of two equal halves.

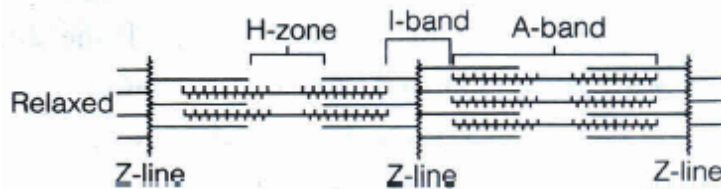
Each half of a pectoral girdle consists of clavicle and scapula. Scapula is a large triangular flat bone. There is glenoid cavity at the joint of scapula, clavicle and acromian process, which articulates with the head of humerus to form the shoulder joint.

Each half of pelvic girdle is formed by three bones, i.e., ilium, ischium and pubis. At the point of their fusion, there is a cavity called acetabulum to which the head of femur articulates.

24)

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(i) The calcium ions after contraction are quickly pumped back to the sarcoplasmic cisternae. This leads to blocking of active sites on actin. The Z-line returns to the original position. Causing muscles to return to its original position, i.e., relaxation form.



(ii) Repeated activation of the muscles leads to accumulation of lactic acid due to anaerobic breakdown of glycogen in them which causes fatigue.