

Locomotion and Movement

1. **Assertion (A):** Trachea is lined by ciliated epithelium.

Reason (R): The co-ordinated movements of cilia in the trachea help in removing dust particles and some of the foreign substances inhaled along with atmospheric air.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

2. **Assertion (A):** Skeletal muscles are closely associated with the skeletal components of the body.

Reason (R): Skeletal muscles are primarily involved in locomotory actions and changes of body postures.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

3. **Assertion (A):** Skeletal muscle fibre is syncytium as the sarcoplasm contains many nuclei.

Reason (R): The sarcoplasmic reticulum of the muscle fibre is the store house of calcium ions.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

4. **Assertion (A):** Contraction of a muscle fibre takes place by the sliding of the thin filaments over the thick filaments.

Reason (R): The central part of thick filament is not overlapped by thin filaments in a resting state.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

5. **Assertion (A):** During muscle contraction I-band and A-band get reduced.

Reason (R): During contraction thin filament slides over myosin filament.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

6. **Assertion (A):** Red muscles are also called aerobic muscles.

Reason (R): These muscles contain plenty of mitochondria which can utilize the large amount of oxygen stored in them for ATP production

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

7. **Assertion (A):** The skull region articulates with the superior region of the vertebral column with the help of two occipital condyles.
Reason (R): The number of cervical vertebrae are seven in almost all mammals including human beings.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
8. **Assertion (A):** The two halves of the pelvic girdle meet ventrally to form the pubic symphysis.
Reason (R): Pubic symphysis consist of immovable fibrous connective tissue.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
9. **Assertion (A):** Ca^{++} play an important role in the muscle contraction.
Reason (R): Calcium bind with a subunit of troponin on actin filaments and thereby remove the masking of active sites for myosin.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
10. **Assertion (A):** First seven pairs of ribs are called true ribs.
Reason (R): They are attached to the thoracic vertebrae dorsally and ventrally connected to the sternum with the help of hyaline cartilage.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
11. **Assertion (A):** Progressive degeneration of skeletal muscle mostly due to genetic disorder, is muscular dystrophy.
Reason (R): Rapid spasms in muscle due to low Ca^{++} in body fluid, is tetany.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
12. **Assertion (A):** Muscle having special feature like excitability, conductivity & contractility.
Reason (R): Neuron having same type of character which equally found in muscle also.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
13. **Assertion (A):** In the contraction of muscle myosin slide on actin filament.
Reason (R): Actin become constant & myosin shows rotational movement proved by sliding filament theory.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false
14. **Assertion (A):** Maximum degree of mobility can be seen with a ball & socket synovial joint.
Reason (R): A ball can rotate in a hollow spherical socket on infinite axes.
 (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 (3) (A) is true but (R) is false
 (4) Both (A) and (R) are false



15. Assertion (A): When the muscle fibre contracts, sarcomere length is reduced.

Reason (R): Sliding of myosin filament occurs due to rotational movement of myosin head.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

16. Assertion (A): Arthritis is the inflammation of synovial joints.

Reason (R): Synovial joints are mobile type of joints.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

17. Assertion (A): Axis vertebrae help in rotation of neck.

Reason (R): Centrum is absent in Atlas vertebrae.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

18. Assertion (A): Recurrent activation of the skeletal muscles results in fatigue.

Reason (R): Aerobic breakdown of glycogen in the muscles leads to the accumulation of lactic acid.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

Directions: In the following questions, a statement of assertion is followed by a statement of reason.

Mark the correct choice as:

- (a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- (c) If Assertion is true but Reason is false.
- (d) If both Assertion and Reason are false.

19. **Assertion:** The portion of the myofibril between two successive 'Z' lines is considered as the functional unit of contraction called sarcomere.
Reason: During contraction, 'I' bands get reduced whereas 'A' bands retain the length, thereby causing shortening of the sarcomere.

20. **Assertion:** Fatigue is inability of muscle to relax.
Reason: It is due to lactic acid accumulation by repeated contractions.

21. **Assertion :** The phase of muscle contraction occurs when myosin binds and releases actin.
Reason : Muscle contraction is initiated by a signal sent by the peripheral nervous system via motor neuron.

22. **Assertion:** Red muscles depend on anaerobic process for energy.
Reason: Red muscles have few number of mitochondria in them.

23. **Assertion:** Human has dicondylic skull.
Reason: Skull articulates with superior region of the vertebral column with the help of two occipital condyles.

24. **Assertion:** First seven pairs of ribs are called true ribs.
Reason: These ribs are not connected ventrally to the sternum.

25. **Assertion :** Ball and socket joints are the most mobile joints.

Reason : Synovial fluid is present here.

26. **Assertion:** The joint between atlas and axis is an example of gliding joint.

Reason: Gliding joint allows movement primarily in one plane.

27. **Assertion :** Inflammation of a skeletal joint may immobilize the movements of the joint.

Reason : Uric acid crystals in the joint cavity and ossification of articular cartilage leads to this.

28. **Assertion:** Visceral muscles are smooth in appearance.

Reason: Many muscle cells assemble in a branching pattern to form a visceral muscle.

29. **Assertion :** Biceps and triceps are called antagonistic muscles.

Reason : This is due to the fact that they contract and relax together.

30. **Assertion :** Arthritis or inflammation of a joint makes the joint painful.

Reason: Some toxic substances are deposited at the joint.

31. **Assertion:** On stimulation, a muscle cell releases calcium ions (Ca^{2+}) from sarcoplasmic reticulum.

Reason: By reacting with a protein complex, Ca^{2+} uncover active sites on the actin filaments.

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Ans.	1	1	2	2	4	1	2	3	1	1	2	3	4	1	3	2	2	3

19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.				
B	A	C	D	A	C	B	D	A	C	C	C	b				