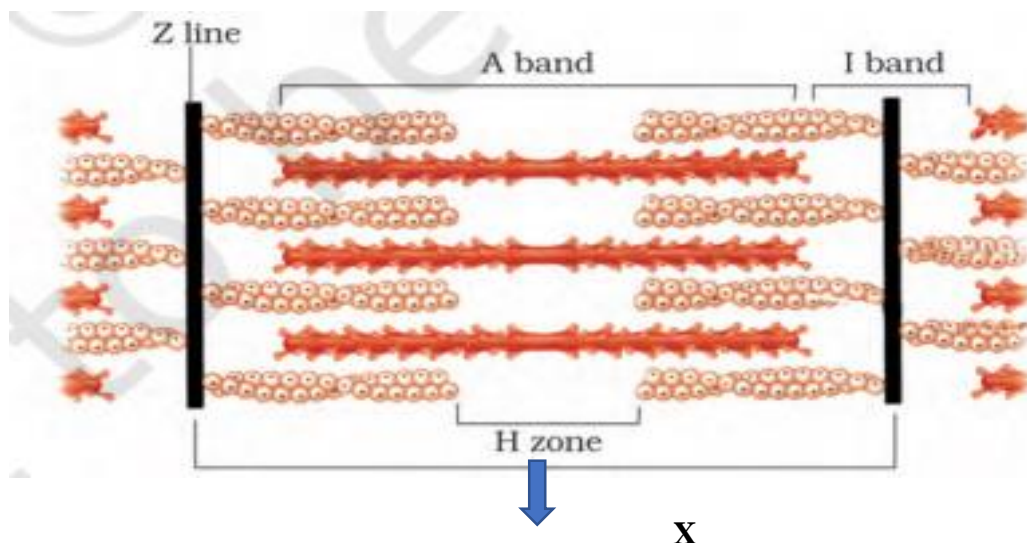




Class: XI	Department: SCIENCE 2021 – 22 SUBJECT : BIOLOGY	Date of submission: Third week of November 2021
Worksheet No: 13 WITH ANSWERS	UNIT: HUMAN PHYSIOLOGY LOCOMOTION AND MOVEMENT	Note: A4 FILE FORMAT
NAME OF THE STUDENT	CLASS & SEC:	ROLL NO.

CASE STUDY- OBJECTIVE TYPE QUESTIONS (1 Marks.)

Observe the diagram and answer the questions that follows



1. Muscle fibre is a syncytium as the sarcoplasm contains

- a) Myofibrils
- b) Many nuclei.
- c) Calcium ions
- d) Proteins

2. **Assertion:** A characteristic feature of the muscle fibre is the presence of a large number of myofibrils

Reason: Each myofibril has alternate dark and light bands on it

- a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
- b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
- c. Assertion is true but reason is false.
- d. Both assertion and reason are false

3. Identify the part marked X as

- a) Sarcomere
- b) Myosin
- c) Actin
- d) Sarcoplasmic reticulum

4. ----- is considered as the functional unit of contraction

- a) The portion of the myofibril between two successive 'H' lines
- b) The portion of the myofibril between two successive 'A' lines
- c) The portion of the myofibril between two successive 'Z' lines
- d) The portion of the myofibril between two successive 'M' lines

5. Myosin filaments are thinner as compared to the Actin filaments

True / False

6. **Assertion:** In a resting state, the edges of thin filaments partially overlap the free ends of the thick filaments leaving the central part of the thick filaments.

Reason: During contraction, the central part of the thick filaments gets overlapped as the thin filament slides over the thick filament

- a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
- b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
- c. Assertion is true but reason is false.
- d. Both assertion and reason are false

OBJECTIVE TYPE QUESTIONS-MCQS (1 Marks.)

1.The collagenous connective tissue that binds Muscle bundles of skeletal muscle is

- a. Fascicles
- b. Fascia
- c. Gluteus maximus
- d. None

2.Skeletal muscles have alternate dark and light band (striated). The proteins responsible for this is:

- a Actin-myosin
- b. Leptin-ghrelin
- c. Arginine-methionine
- d. None

3.The structural and functional unit of muscular tissue is:

- a. Muscle fibre
- b. Fascia
- c. Sarcomere
- d. A and I band

4.The fibre line that bisect the I-band (isotropic/light band) is:

- a. Z-line
- b. M-line
- c. S-line
- d. P-line

5. The fibre line that bisect the A-band (anisotropic/dark band) is:

a. Z-line

b. M-line

c. S-line

d. P-line

6. Which two lines make a sarcomere?

a. Two Z-lines

b. Two M-lines

c. Z and M line

d. None

7. Each actin fibre run parallel with other fibres. The other fibre is/are:

a. Myosin

b. Troponin

c. Tropomyosin

d. b and c

8. Junction between a nerve and a muscle is:

a. Synapse

b. Nodes of Ranvier

c. Neuromuscular junction

d. None

9. Which neurotransmitter generate action potential in a sarcolemma?

a. Serotonin

b. Acetylcholine

c. Dopamine

d. Adrenaline

10. Which band moves during a muscle contraction?

- a. Actin
- b. Myosin
- c. Both
- d. None

11. ____ is the muscle's contractile protein.

- a. Globulin
- b. Elastin
- c. Myosin
- d. None of the above

12. The _____ is a membrane-bound structure located within the muscle's cells. Its main function is to store calcium ions.

- a. Sarcoplasmic reticulum
- b. Fibrin
- c. Myosin
- d. None of the above

SHORT ANSWER TYPE QUESTION (2 Marks)

Q.13. How is locomotion different from the movement?

Q.14. Name the cell referring to sarcoplasm, sarcoplasmic reticulum, and sarcolemma. Also, list the parts of cells that refer to these names.

Q.15. Mark the components of the actin filament in the diagram given below:



LONG ANSWER TYPE QUESTIONS (3 Marks)

Q.16. Where do muscle contractions derive their energy from?

Q.17. Describe the significance of Ca^{2+} ions in the contraction of muscles.

HINTS

ANSWERS MCQs 1-12

1-b	2-a	3-a	4-a	5-b	6-a	7-d	8-c	9-b	10-a	11-c	12-a
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A.14. Each muscle cell or fibre is lined by the plasma membrane known as the sarcolemma which contains the sarcoplasm. A muscle fibre is a syncytium as the sarcoplasm possesses many nuclei. The sarcoplasmic reticulum of the muscle fibres stores calcium ions.

A.15. Troponin, Tropomyosin, F-actin.

LONG ANSWER TYPE QUESTIONS (3 Marks)

A.16. *From ATP. Every myosin molecule contains myosin ATPase, an enzyme at its head.

* In the presence of this enzyme along with Ca^{2+} , Mg^{2+} ions, the inorganic phosphate, and ADP it is disintegrated by ATP to release energy from the myosin head.

*This energy causes myosin to cross bridges to bind to actin.

*These cross-bridges that are energized, move, resulting in the sliding of thin myofilaments with the thick myofilaments, thereby causing muscle contraction.

A.17. * Calcium plays a key role in the muscle contraction process.

*During contraction of muscles, from the motor endplate, an action potential passes over the sarcolemma and sarcoplasmic reticulum, triggers it to produce Ca^{2+} ions into the sarcoplasm.

*The binding of calcium ions to the troponin causes its shape and position to change which in turn modifies position and shape of tropomyosin that binds the troponin.

*This shift presents the active sites on the molecule, F-actin which prompts the myosin cross-bridges to bind to these active sites.

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