Shiksha Classes, Bhandara

Biology

Locomotion And Movement

(1.) A simple form of movement can be epitomized by

(a.) reflex action in human body
(b.) protoplasmic streaming in amoeba
(c.) blinking of eyes
(d.) all of these

(2.) Movements in living organisms

(a.) are always voluntarily controlled.
(b.) always prompt locomotion.
(c.) can effectuate locomotion.
(d.) are involuntary responses to stimuli.

(3.) Which of the following set of structures exhibit movements but are not beneficent in locomotion?

(a.) Jaws, eyelids, tongue
(b.) Cilia, tentacles, tongue
(c.) Cytoplasm, eyelids, jaws
(d.) Tentacles, limbs, flagella

(4.) Consider the following statements:
(A) A movement involving change in place or location is termed as locomotion.
(B) Locomotion is the significant feature of living beings.
Select the correct option.

(a.) A is true, B is false.
(b.) Both A and B are false.
(c.) A is false, B is true.
(d.) Both A and B are true.

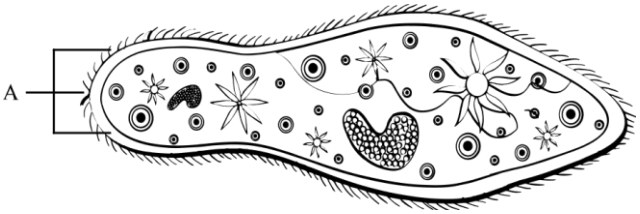
(5.) Match the following columns:

Column-I (Locomotory structures)	**Column-II** (Organisms)
(A) Tentacles	(1) Paramecium
(B) Cilia	(2) Amoeba
(C) Pseudopodia	(3) Hydra
(D) Flagella	(4) Bacteria

Select the correct option.

	A	B	C	D
(a.)	4	3	2	1
(b.)	1	4	3	2
(c.)	3	1	2	4
(d.)	2	4	3	1

(6.) Refer to the given diagram and select the correct option representing the function of the structure labelled as A.



(a.) Helps in capturing the prey

(b.) Helps in moving food through cytopharynx and locomotion

(c.) Helps in locomotion

(d.) Both (a) and (c)

(7.) Select the incorrect statement.

(a.) Mechanism of locomotion in an organism depends upon its habitat.

(b.) All locomotions are movement, but all movements are not locomotion.

(c.) Locomotion is performed in search of food, mate, favourable climatic conditions, etc.

(d.) Movement and locomotion are always voluntary in nature.

(8.) Identify the cells of human body which exhibit amoeboid movements.

(a.) Myocytes, Blastocyst, Follicle

(b.) Follicular cells, RBCs, Platelets

(c.) Macrophages, Microfilaments, Leucocytes

(d.) RBCs, WBCs, Platelets

(9.) Ciliary movements in human body

(a.) are effected by pseudopodia.

(b.) require streaming of protoplasm.

(c.) help to move cells in internal tubular organs.

(d.) do not occur significantly.

(10.) Consider the following statements:
(A) Ova is transported from ovary to uterus after ovulation due to the ciliary movements in fallopian tube.
(B) Spermatozoa swim in female reproductive tract following insemination, with the help of cilia.
Select the correct option.

(a.) A is true, B is false.

(b.) Both A and B are true.

(c.) A is false, B is true.

(d.) Both A and B are false.

(11.) Muscular movements occur due to

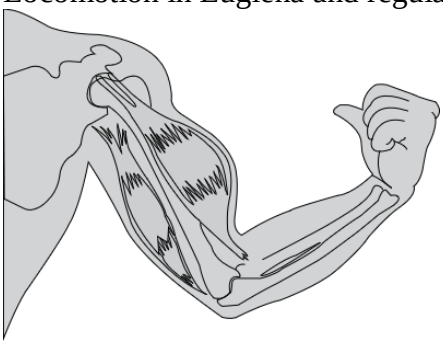
(a.) beating of cilia

(b.) streaming of protoplasm

(c.) contractile ability of cells

(d.) pseudopodial structures of cells

(12.) Locomotion in Euglena and regulation of water current in Sponges is accomplished by



(a.) cilia only
(b.) flagella only
(c.) cilia and flagella, respectively
(d.) cilia and myocytes, respectively

(13.) Match the following columns:

Column-I	**Column-II**
(A) Muscular movement	(1) Occur in trachea
(B) Amoeboid movement	(2) Involves streaming of cytoplasm
(C) Ciliary movement	(3) Movement of tongue
(D) Flagellar movement	(4) Exhibited by spermatozoa

Select the correct option.

	A	B	C	D
(a.)	4	3	2	1
(b.)	1	4	2	3
(c.)	2	1	3	4
(d.)	3	2	1	4

(14.) Assertion: Not all the moving cells exhibit locomotion.
Reason: All locomotions are movements.

(a.) Both Assertion and Reason are true, Reason is correct explanation of Assertion.
(b.) Both Assertion and Reason are true, Reason is not the correct explanation of Assertion.
(c.) Assertion is true, Reason is false.
(d.) Both Assertion and Reason are false.

(15.) Assertion: Movement of leucocytes in human body is similar to that in amoeba.
Reason: Leucocytes exhibits ciliary movements.

(a.) Both Assertion and Reason are true, Reason is correct explanation of Assertion.
(b.) Both Assertion and Reason are true, Reason is not the correct explanation of Assertion.
(c.) Assertion is true, Reason is false.
(d.) Both Assertion and Reason are false.

(16.) Muscular tissue originates from the embryonic

(a.) ectoderm (b.) endoderm

(c.) mesoderm (d.) ecto-endoderm

(17.) Consider the following statements:
(A) Muscles form about 75% of body weight in adults.
(B) Muscles in human body can contract and are elastic in nature.
Select the correct option.

(a.) Both A and B are true. (b.) A is true, B is false.

(c.) A is false, B is true. (d.) Both A and B are false.

(18.) Which statement is accurate about all the muscles found in human body?

(a.) They are locomotory in function. (b.) They respond to a stimulus.

(c.) They are under voluntary control. (d.) They are not extensible.

(19.) Match the following columns:

Column-I (Properties of muscles)	**Column-II** (Exposition)
(A) Excitability	(1) Ability to increase amplitude
(B) Contractility	(2) Ability to retain original shape
(C) Extensibility	(3) Ability to shrink
(D) Elasticity	(4) Ability to respond to a stimulus

Select the correct option.

	A	B	C	D
(a.)	4	2	3	1
(b.)	4	1	2	3
(c.)	4	3	1	2
(d.)	1	3	2	4

(20.) Skeletal, visceral and cardiac muscles

(a.) differ in location, but are similar in structure. (b.) possess similar regulatory activities but differ in structure and location.

(c.) possess similar structure and regulatory activities but differ in location. (d.) differ in location, structure and regulatory activities.

(21.) Striated muscles are

(a.) voluntary skeletal muscles (b.) smooth in appearance and involuntary in action

(c.) involuntary striped muscles (d.) vestigial masses in the skeletal components of body

(22.) Among the listed functions, striated muscles are involved in

(a.) locomotory actions
(b.) changes of body posture
(c.) both (a) and (b)
(d.) internal movements of substances

(23.) Consider the following statements:
(A) Visceral muscles are found in the inner walls of hollow visceral organs.
(B) All the visceral muscles are involuntary in action.
Select the correct option.

(a.) A is true, B is false.
(b.) Both A and B are true.
(c.) A is false, B is true.
(d.) Both A and B are false.

(24.) Cardiac muscles are

(a.) smooth in appearance and involuntary in action
(b.) striated, voluntary muscles
(c.) smooth, voluntary muscles
(d.) striated in appearance and involuntary in action

(25.) Identify the incorrectly matched pair.

(a.) Cardiac muscles – Not controlled by nervous system directly
(b.) Smooth muscles – Found in alimentary canal
(c.) Striated muscles – Found in intestine
(d.) Smooth muscles – Found in urinary bladder

(26.) Match the following columns:

Column-I (Type of muscles)	**Column-II** (Properties)
(A) Skeletal muscles	(1) Involuntary muscles
(B) Smooth muscles	(2) Striped and involuntary muscles
(C) Cardiac muscles	(3) Voluntarily controlled

Select the correct option.

	A	B	C
(a.)	1	2	3
(b.)	2	3	1
(c.)	1	3	2
(d.)	3	1	2

(27.) Identify the type of muscle shown in the given diagram and choose the correct option.

(a.) Voluntarily controlled muscles
(b.) Involuntary muscles
(c.) Unstriped voluntary muscles
(d.) Striped involuntary muscles

(28.) Assertion: Muscles lining the reproductive tract in females are smooth in appearance.
Reason: Smooth muscles are not under the voluntary control of nervous system.

(a.) Both Assertion and Reason are correct, Reason is the correct explanation of Assertion.
(b.) Both Assertion and Reason are correct, Reason is not the correct explanation of Assertion.
(c.) Assertion is correct, Reason is incorrect.
(d.) Both Assertion and Reason are incorrect.

(29.) Assertion: Both visceral muscles and cardiac muscles are involuntary muscles.
Reason: All the striated muscles found in human body are voluntary muscles.

(a.) Both Assertion and Reason are correct, Reason is the correct explanation of Assertion.
(b.) Both Assertion and Reason are correct, Reason is not the correct explanation of Assertion.
(c.) Assertion is correct, Reason is incorrect.
(d.) Both Assertion and Reason are incorrect.

(30.) Fascicles are

(a.) muscle bundles of skeletal muscles
(b.) single muscle fibre of smooth muscles
(c.) contractile unit of muscle fibres
(d.) muscle bundles enclosing smooth and skeletal muscles together

(31.) Connective tissue layer surrounding each muscle bundle is made up of

(a.) areolar tissue
(b.) collagen
(c.) adipose tissue
(d.) loose connective tissue

(32.) The plasma membrane of a muscle fibre is technically known as

(a.) plasmalemma
(b.) myolemma
(c.) fibrolemma
(d.) sarcolemma

(33.) Match the following columns:

Column-I	**Column-II**
(A) Myofibril	(1) Collagenous tissue layer
(B) Fascia	(2) Muscle filament
(C) Fascicles	(3) Muscle bundle

Select the correct option.

	A	B	C
(a.)	3	2	1
(b.)	2	1	3
(c.)	1	2	3
(d.)	1	3	2

(34.) The cytoplasm of a muscle fibre is

(a.) non-nucleated sarcoplasm
(b.) uninucleated sarcoplasm

(c.) multi-nucleated syncytium (d.) single nucleus containing myoplasm

(35.) Muscle fibres abundantly contain

(a.) calcium ions in sarcoplasmic reticulum (b.) magnesium ions in sarcoplasm

(c.) sodium ions in sarcolemma (d.) chloride ions in sarcoplasm

(36.) A myofibril of a muscle fibre

(I) is found in sarcoplasm

(II) contains myosin protein throughout its length

(III) possess alternate light and dark bands

(IV) is smooth in appearance Which of the following option is the most appropriate?

(a.) I and II are correct (b.) II and IV are correct

(c.) I and III are correct (d.) I, II and IV are correct

(37.) The light and dark regions of myofibrils contain

(a.) myosin and actin, respectively (b.) actin and myosin, respectively

(c.) actin and troponin, respectively (d.) troponin and myosin, respectively

(38.) The term isotropic refers to

(a.) light band of myofibril containing actin protein. (b.) dark band of myofibril containing myosin protein.

(c.) persistent polarity of proteins throughout the length of myofibril. (d.) same response of each myofibril to different stimuli.

(39.) Select the incorrect statement regarding the thick filaments of myofibrils.

(a.) They are arranged as rod-like structures, parallel to each other. (b.) They are found in the light bands of myofibrils.

(c.) They are associated with the anisotropic regions. (d.) They are composed of myosin filaments.

(40.) Choose the incorrectly matched pair.

(a.) Anisotropic band − Dark band (b.) Isotropic band − Actin

(c.) Actin filaments − Thick filaments (d.) Thin filaments − Light band

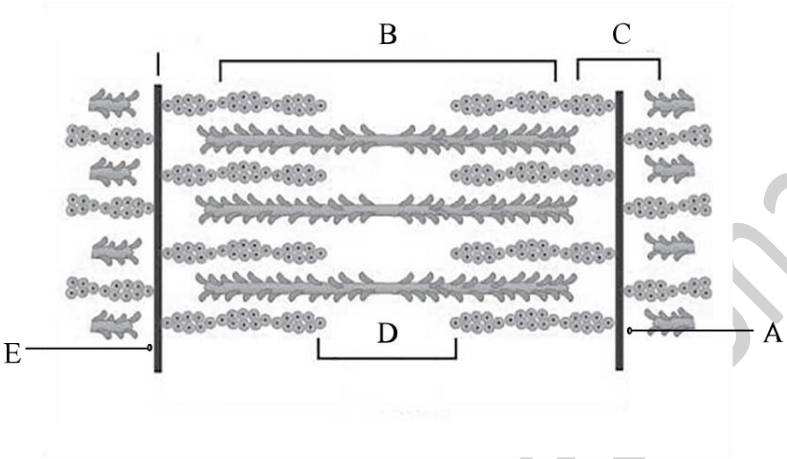
(41.) Match the following columns:

Column-I	**Column-II**
(A) Z – line	(1) Fibrous membrane in the middle of A-band
(B) M – line	(2) Middle regions of A-band
(C) H – zone	(3) Elastic fibre, firmly attached to thin filament

Select the correct option.

	A	B	C
(a.)	1	2	3
(b.)	3	1	2
(c.)	2	3	1
(d.)	1	3	2

(42.) Locate the position of A band, I band and Z-line in the diagram given below:



(a.) D B E (b.) D C A

(c.) C B A (d.) B C A

(43.) Z-line in a myofibril can be located

(a.) between the thick and thin filaments (b.) at the centre of I-band

(c.) at the centre of A-band (d.) at the centre of each I and A-band

(44.) Consider the following statements:
(A) Thin filament in a myofibril are found firmly attached to the M-line.
(B) M-line is a thin membrane in the middle regions of thick-filaments.
Select the correct option.

(a.) A is true, B is false (b.) Both A and B are true

(c.) A is false, B is true (d.) Both A and B are false

(45.) While studying the anatomical details of a muscle fibre, Raman was not able to locate the H-zone. Which option indicate the most appropriate reason for this situation?

(a.) H-Zone appears in a contracted muscle state only, it cannot be located in a resting muscle fibre.

(b.) Raman may not be focussing at the central part of thick filament.

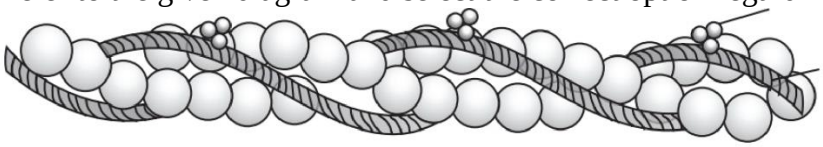
(c.) Raman should focus the edges of I-band to locate H-zone.

(d.) Raman should locate Z-line first as H-zone is present adjacent to it.

(46.) The structural components of thin filaments include

(a.) filamentous actins, tropomyosin and troponin
(b.) meromyosin and globular actins
(c.) troponin, tropomyosin and meromyosin
(d.) meromyosin and tropomyosin

(47.) Refer to the given diagram and select the correct option regarding it.



(a.) Troponin – Contains active binding sites on myosin
(b.) Tropomyosin – Mask active sites during resting stage
(c.) Filamentous – Polymer of globular actins actin
(d.) Actin filament – Made up of three F actins

(48.) Consider the following statements:
(A) In an actin filament, two F-actins are helically wound to each other.
(B) Tropomyosin run close to F-actin throughout its length in thin filaments.
Select the correct option.

(a.) A is true, B is false.
(b.) Both A and B are true.
(c.) A is false, B is true.
(d.) Both A and B are false.

(49.) In a thin filament, troponins are found

(a.) within the globular actins.
(b.) between the helically wound F actins.
(c.) at the edges of F-actins.
(d.) at regular intervals of tropomyosin.

(50.) The monomeric form of thick filament is

(a.) meromyosin
(b.) troponin
(c.) tropomyosin
(d.) actomyosin

ANSWER

(1.)	b	**(2.)**	c	**(3.)**	a	**(4.)**	a	**(5.)**	c
(6.)	b	**(7.)**	d	**(8.)**	c	**(9.)**	c	**(10.)**	a
(11.)	c	**(12.)**	b	**(13.)**	d	**(14.)**	b	**(15.)**	c
(16.)	c	**(17.)**	c	**(18.)**	b	**(19.)**	c	**(20.)**	d
(21.)	a	**(22.)**	c	**(23.)**	b	**(24.)**	d	**(25.)**	c
(26.)	d	**(27.)**	a	**(28.)**	b	**(29.)**	c	**(30.)**	a
(31.)	b	**(32.)**	d	**(33.)**	b	**(34.)**	c	**(35.)**	a
(36.)	c	**(37.)**	b	**(38.)**	a	**(39.)**	b	**(40.)**	c
(41.)	b	**(42.)**	d	**(43.)**	b	**(44.)**	c	**(45.)**	c
(46.)	a	**(47.)**	c	**(48.)**	b	**(49.)**	d	**(50.)**	a

EXPLANATION

(1.) (b.) A simple form of movement in which no specialised structure and mechanism involved is protoplasmic streaming in amoeba. Reflex actions and blinking of eyes are controlled and coordinated by neural signals, muscular movements, etc.

(2.) (c.) Movement of many structures in living organisms assist in locomotion. For example, movement of limbs, tentacles and flagella. But, not all the movements contribute to locomotion.

(3.) (a.) Not all the structures in living organisms perform dual functions of movement and locomotion. For example, movement of jaws, eyelids and tongue do not contribute to locomotion. Thus, all movements do not result in locomotion but all locomotory structures exhibit movements.

(4.) (a.) When any movement of a structure is accompanied by change in place or location, it is termed as locomotion. Not all the structures and even organisms exhibit locomotion, e.g., plants. All the living beings exhibit different forms of movements. Therefore, movement is one of the significant features of living organisms, and not locomotion.

(5.) (c.) A-3, B-1, C-2, D-4

(6.) (b.) In the given diagram, A represents cilia of Paramecium. It helps in the movement of food through cytopharynx and in locomotion.

(7.) (d.) Locomotion is the voluntary movement in living beings. But, not all the movements are voluntary in nature. For e.g., in human body, movement of food through oesophagus, i.e., peristalsis is involuntary in nature.

(8.) (c.) In human body macrophages, leucocytes and microfilaments show amoeboid movements. These movements are carried out by the cytoplasmic processes of the cells.

(9.) (c.) In human body, cilia helps to move particles or cells through the internal tubular organs which are lined by ciliated epithelium.

(10.) (a.) Female gamete, i.e., ova is a non-motile structure and it moves through fallopian tube by the coordinated movement of cilia in it. In contrast, male gamete, i.e., spermatozoa is a motile structure and it bears flagella. Spermatozoa swim in female reproductive tract with the help of flagellar movement only.

(11.) (c.) Muscular movements in human body are achieved by the contractile property of muscle cells. These cells contract and relax in a coordinated manner and thus, play a major role in locomotion, neural activities, etc.

(12.) (b.) Flagellar movements are involved in the locomotion of protozoans like Euglena, regulation of water current in the spongocoel of poriferans, swimming of spermatozoa, etc.

(13.) (d.) A-3, B-2, C-1, D-4

(14.) (b.) All the movements are not locomotion, but all locomotions are voluntary movements. In human body, jaws, eyelids and tongue exhibit movement, but these structures are not involved in locomotion.

(15.) (c.) Leucocytes in human body exhibit amoeboid movement which is effected by pseudopedia. It is formed by streaming of protoplasm and is similar to that found in amoeba.

(16.) (c.) Muscular tissue is formed by the embryonic mesoderm. It is the middle layer, found in between outer ectoderm and inner endoderm.

(17.) (c.) Muscles contribute about 40–50 percent of total body weight in adult humans. These contractile and elastic structures are helpful to carry out various activities including locomotion.

(18.) (b.) All the muscles found in human body are excitable, i.e., they respond or get excited after receiving a stimulus, whether it is internal or external.

(19.) (c.) A-4, B-3, C-1, D-2

(20.) (d.) Skeletal, visceral and cardiac muscles differ in their location, structure and regulatory activities. Depending upon these factors, these are specialised to perform varying functions in different locations of human body.

(21.) (a.) Striated muscles are voluntary muscles associated with the skeletal system. These muscles are under the voluntary control of nervous system, and thus, they are primarily concerned with locomotion.

(22.) (c.) As striated muscles are voluntary in nature they can be moved when desired. This property of striated muscles is useful for an organism to change body posture and in locomotion. Internal movements of a body are not under the control of voluntary muscles.

(23.) (b.) Visceral muscles are smooth involuntary muscles found in the inner walls of hollow visceral organs. These muscles are not under the direct control of an organism, and thus, known as involuntary muscles.

(24.) (d.) Cardiac muscles are striated involuntary muscles. Like skeletal muscles, they possess striped appearance, and like smooth muscles, they are not under direct control of an organism.

(25.) (c.) Striated muscles are voluntary muscles which are found associated with skeletal components. They are found in biceps, thighs, etc. Intestine is lined by involuntary smooth muscles.

(26.) (d.) A-3, B-1, C-2

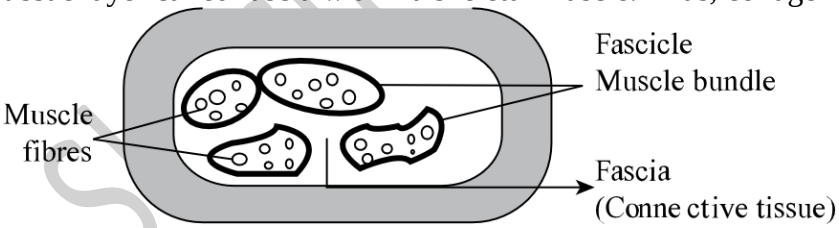
(27.) (a.) The given diagram represents biceps muscles which are skeletal, voluntary muscles. These muscles are under the direct control of nervous system.

(28.) (b.) Smooth muscles are found in the inner walls of hollow visceral organs. These muscles are not controlled by nervous system directly and thus, these are involuntary in nature. Reproductive tract, digestive tract, etc., are lined by smooth muscles.

(29.) (c.) Like smooth or visceral muscles, the activity of cardiac muscles is not controlled by nervous system directly. Thus, these muscles are involuntary in nature. Not all the striated muscles are voluntary in nature. Cardiac muscles are striated in appearance but these are not voluntary muscles.

(30.) (a.) The muscle bundles of skeletal muscles are called fascicles. A skeletal muscle contains a number of fascicles held together by a connective tissue layer called fascia. A fascicle contain numerous muscle fibres.

(31.) (b.) The muscle bundles called fascicles are held together by a collagenous connective tissue layer called fascia within a skeletal muscle. Thus, collagen acts as a ground substance.



(32.) (d.) The plasma membrane of muscle fibre is called sarcolemma. The prefix ‘sarco’ is derived from the Greek language which means muscle.

(33.) (b.) A-2, B-1, C-3

(34.) (c.) The cytoplasm of muscle fibres, i.e., sarcoplasm consists of numerous nuclei which results in a syncytium condition. The sarcoplasm is rich in myoglobin and glycosomes.

(35.) (a.) The sarcoplasm of a muscle fibre is rich in calcium ions as they play a major role in muscle contraction.

(36.) (c.) The sarcoplasm of a muscle fibre contains abundant myofibrils which are arranged parallel to each other. These myofibrils are striped in appearance due to the presence of alternate light and dark bands.

(37.) (b.) In a myofibril, alternative light and dark bands are present. The light bands are composed of actin proteins, while the dark bands contain myosin protein. Actin is globular protein, while myosin is motor protein having ATPase activity.

(38.) (a.) The light bands of myofibrils, containing actin proteins are called isotropic because in polarized light, these bands are not bi-refractive and show isotropic behaviour.

(39.) (b.) Thick filaments of myofibrils are composed of myosin protein and they are found in the dark regions. Light regions of myofibrils are composed of thin filaments, made up of actin protein.

(40.) (c.) Actin filaments are thin as compared to the myosin filaments. Therefore, they are referred to as thin filaments while myosin filaments are called thick filaments.

(41.) (b.) A-3, B-1, C-2

(42.) (d.) In the given diagram, A is Z-line, B is A-band, C is I-band, D is H-zone and E is Z-line.

(43.) (b.) Z-line is found in the centre of each I-band. The portion of myofibril in between two Z-lines is called sarcomere.

(44.) (c.) Thin filaments of a myofibril are found attached to the Z-line. Thin filaments are found in light regions called I-bands. Z-line is found in the centre of each I-band.

(45.) (c.) H-zone (or Hensen zone) is the central region of thick filament, and it is not overlapped by the thin filaments. In a cross-sectional view of a sarcomere, it appears as its central region.

(46.) (a.) The thin actin filaments are made up of filamentous actins, tropomyosin and troponin. All these three components are necessary for muscle contraction.

(47.) (c.) The F-actin of each actin filament is a polymer of monomeric globular (G) actins. Each actin filament consists of two helically wound F-actins. Troponins are found on tropomyosins which are filamentous proteins found closer to the F-actins throughout its length.

(48.) (b.) Each actin filament consists of two helically wound F-actins and these are also interwoven with two tropomyosin filaments throughout its length.

(49.) (d.) Troponins are found at regular intervals of tropomyosin. It is a complex protein, consisting of three subunits. In resting stage, one of these subunits masks the active sites on actin filaments for myosin.

(50.) (a.) Each thick filament consists of several myosin monomers called meromyosins. Each meromyosin possess a globular head and a tail.