

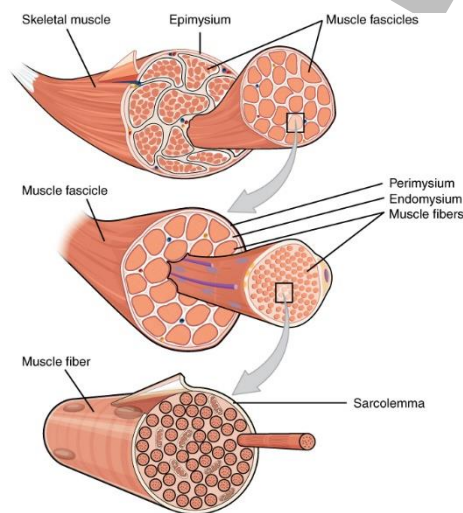
**ENTRANCE TEST 2020
MDCAT
TEST # 4
BIOLOGY**

THE XCHER COPY 2020

- Q.1** When viewed in high magnification, each _____ is seen to contain a large number of myofibrils?
 A) Muscle bundle
 B) Sarcomere
 C) Myofilament
 D) Muscle fibre

Explanation:

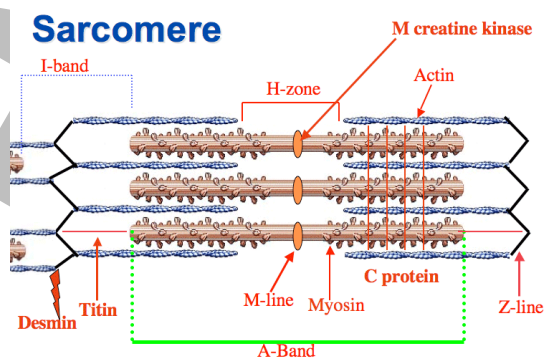
When viewed in high magnification, each muscle fibre is seen to contain a large number of myofibrils.



- Q.2** The H-zone is bisected by dark line called:
 A) I-band
 B) M-line
 C) A-line
 D) Z-line

Explanation:

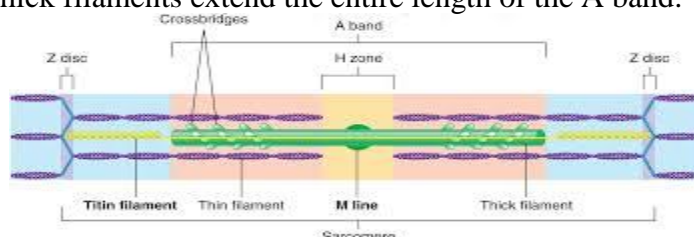
The H-zone is bisected by dark line called M-line.



- Q.3** The central thick filaments extend the entire length of the:
 A) A band
 B) I band
 C) Thin filament
 D) H zone

Explanation:

The central thick filaments extend the entire length of the A band.



Q.4 Cytoplasm of the muscle is known as:

- A) Axoplasm
B) Sarcoplasm
C) Sarcolemma
D) Protoplasm

Explanation:

Cytoplasm of the muscle is known as sarcoplasm.

Q.5 The cytoplasm of the muscle cell contains large amount of stored _____ and _____:

- A) Glycogen, myosin
B) Glycogen, hemoglobin
C) Starch, myoglobin
D) Glycogen, myoglobin

Explanation:

The cytoplasm of the muscle cell contains large amount of stored glycogen and myoglobin.

Q.6 Overlapping of thick and thin filaments occurs in:

- A) I-band
B) A-band
C) M-band
D) Z-band

Explanation:

Overlapping of thick and thin filaments occurs in A-band.

Q.7 Which one of the following changes occur when skeletal muscle contracts?

- A) I-band shortens only
B) A band shortens and Z-lines moves further apart
C) I-band shortens and Z-lines get closer
D) Actin filament contracts

Explanation:

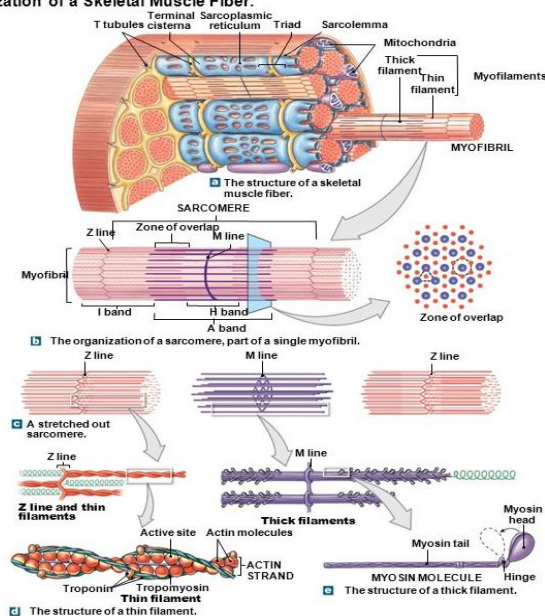
According to this theory, the thin filaments slide past the thick one's so that actin and myosin filaments overlap to greater degree. Thus, the Z-line is brought closer together, I-band shortens, the H zone disappears.

Q.8 Which one of the following part of sarcomere is isotropic?

- A) I band
B) A band
C) H zone
D) Z line

Explanation:

Figure 7-2 The Organization of a Skeletal Muscle Fiber.



© 2013 Pearson Education, Inc.

Q.9 It is a red pigment that stores oxygen in muscle cell:

- A) Hemoglobin
B) Myoglobin
C) Myosin
D) Actin

Explanation:

The pigment which stores oxygen in muscles is myoglobin.

Q.10 Pick the diameter of a myofibril:

- A) 10-100 μm C) 16-18 μm
B) 1-2 μm D) 7-8 μm

Explanation:

1 – 2 μm is the diameter of myofibril.

Q.11 It cannot polarize visible light:

- A) A-band of sarcomere C) H-band of sarcomere
B) I-band of sarcomere D) M-line of sarcomere

Explanation:

I-band of sarcomere cannot polarize visible light.

Q.12 When muscle fibre contracts all of the following events occur, EXCEPT?

- A) Z-line is brought closer C) H-zone disappears
B) I-band shortens D) A-band shortens

Explanation:

When muscle fibre contracts A-band shortens event does not occur.

Q.13 Generally, each end of the entire skeletal muscle is attached to bone by:

- A) Ligament C) Tendon
B) Sarcomere D) Collagen

Explanation:

Myofibril consists of many thread like structures called myofilaments.

Q.14 These muscles are primarily involved in locomotory actions and changes of body postures:

- A) Smooth C) Skeletal
B) Cardiac D) Unstripped

Explanation:

Skeletal muscles are primarily involved in locomotory actions and changes of body postures.

Q.15 It extends the entire length of the A-band of sarcomere:

- A) Actin filaments C) Thin filaments
B) Central thick filament D) Thin and thick filaments

Explanation:

Central thick filament extends the entire length of the A-band of sarcomere.

Q.16 Sarcomeres are part of:

- A) Muscle fibres C) Myofilaments
B) Myofibrils D) Myonemes

Explanation:

Sarcomeres are part of myofibrils.

Q.17 A structural protein that with myosin carries out contraction; also called microfilaments is:

- A) Fibrin C) Actin

B) Troponin

D) Tropomyosin

Explanation:

A structural protein that with myosin carries out contraction; also called microfilaments is actin. (**Glossary**)

Q.18 Cyclic activity of cross bridges is regulated by:

A) Ca⁺² ions

C) Troponin

B) ATP

D) Actin

Explanation:

Cyclic activity of cross bridges is regulated by ATP.

Q.19 The thick filament is about _____ nm in diameter:

A) 8

C) 10

B) 7

D) 16

Explanation:

The thick filament is about 16 nm in diameter.

Q.20 Cross bridges are the lateral processes (projection) on:

A) Actins

C) Troponins

B) Tropomyosins

D) Myosins

Explanation:

Cross bridges are the lateral processes (projection) on myosins.

Q.21 When cross bridges contract they pull the actin filament towards the?

A) Centre of the sarcomere

C) Right side of the sarcomere

B) Ends of the sarcomere

D) Left side of the sarcomere

Explanation:

When cross bridges contract they pull the actin filament towards the centre of the sarcomere.

Q.22 Stiffening of body due to lack of ATP is called:

A) Tetany

C) Rigor mortis

B) Cramp

D) Tetanus

Explanation:

Stiffening of body due to lack of ATP is called rigor mortis.

Q.23 _____ tail consists of two long polypeptide chains coiled together:

A) Troponin

C) Actin

B) Tropomyosin

D) Myosin

Explanation:

Myosin tail consists of two long polypeptide chains coiled together.

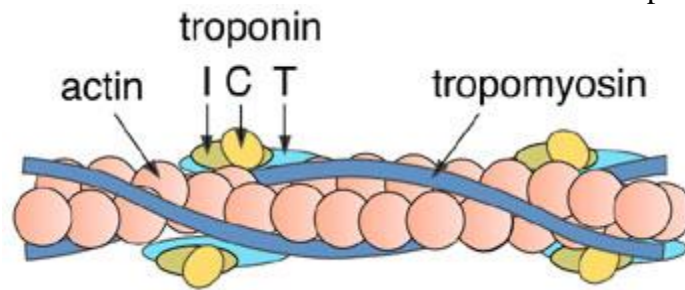
THE MCHER COPY 2020

Q.24 Twisting around the actin chains are two strands of another protein,:

- A) Troponin
B) **Tropomyosin**
C) Myosin
D) Myoglobin

Explanation:

Twisting around the actin chains are two strands of another protein, tropomyosin.



Q.25 T-tubule and the terminal portion of the adjacent envelope of sarcoplasmic reticulum form:

- A) Z-line
B) **Triads**
C) H-zone
D) T-system

Explanation:

T-tubule and the terminal portion of the adjacent envelope of sarcoplasmic reticulum form triads.

Q.26 The sarcolemma of muscle fibre folds inwards and forms a system of tubes running through the sarcoplasm which is called:

- A) Myofilament
B) Sarcoplasmic reticulum
C) Z-lines
D) **Transverse tubules**

Explanation:

The sarcolemma of muscle fibre folds inwards and forms a system of tubes running through the sarcoplasm which is called transverse tubules.

Q.27 When more energy is required in muscle contraction then that energy can also be produced by?

- A) Glucose
B) **Creatine phosphate**
C) Glycogen
D) Lactic acid

Explanation:

When more energy is required in muscle contraction then that energy can also be produced by phosphocreatine as a secondary source.

Q.28 Lactic acid accumulation in skeletal muscles causes:

- A) **Muscle fatigue**
B) Tetany
C) Atrophy
D) Cramp

Explanation:

Lactic acid accumulation in skeletal muscles causes muscle fatigue. (Page 41)

Q.29 Complete immobilization of muscle leads to:

- A) Muscle fatigue
B) **Muscle atrophy**
C) Cramp
D) Tetany

Explanation:

Complete immobilization of muscle leads to muscle atrophy.

The amount of work a muscle does is reflected in changes in the muscle itself. When muscles are used actively, they increase in size or strength and become more efficient and fatigue resistant. Aerobic exercises such as swimming, jogging, and fast walking result in several changes in skeletal muscles. Capillaries surrounding the muscle fibres, as well as mitochondria within them increase in number and fibre synthesizes more myoglobin. These changes result in more efficient muscle metabolism and resistance to fatigue. Complete immobilization of muscle leads to muscle weakness and severe atrophy.

Q.30 Skeletal muscles are:

- A) Unstriated
B) **Voluntary**
C) Involuntary
D) Earliest

Explanation:

Skeletal muscles are consciously controlled and therefore they are called voluntary muscles.

Q.31 Which ion is essential for muscle contraction?

- A) Sodium
B) **Calcium**
C) Potassium
D) Magnesium

Explanation:

Calcium ions are essential for muscle contraction.

Q.32 Sliding filament theory can be best explained as:

- A) **Actin and myosin filaments do not shorten but rather slide pass each other**
B) When myofilaments slide pass each other, myosin filaments do not shorten
C) When myofilaments slide pass each other actin filaments shorten while myosin filaments do not shorten
D) Actin and myosin filaments shorten and slide pass each other

Explanation:

During muscle contraction, the laterally projecting heads (cross bridges) of the thick myosin myofilaments come in contact with the thin actin myofilaments and rotate on them. This pulls the thin myofilaments toward the middle of the sarcomere, past the thick myofilaments. The Z lines come closer together and the sarcomere becomes shorter. Length of the A band remains constant. Myofilaments (both actin and myosin) stay the same length. Free ends of actin myofilaments move closer to the centre of the sarcomere, bringing Z lines closer together. I bands shorten and H zone narrows. A similar action in all the sarcomeres results in shortening of the entire myofibril and thereby of the whole fibre and the whole muscle.

Q.33 What is sarcomere?

- A) Part between two H-lines
B) Part between two A-lines
C) Part between two I-bands
D) **Part between two Z-lines**

Explanation:

A striated muscle fibre is bounded by sarcolemma. It shows alternating dark and light cross bands, the striations. Dark band is called A band which has at its middle a light zone termed H zone. Light band is known as I band which is crossed through its centre by a dark membrane

called Z line. The part of the muscle fibre between two successive Z lines functions as a contractile unit called sarcomere.

Q.34 Immediate source of energy for muscle contraction is:

- A) ATP
B) Glucose
C) Creatine phosphate
D) Sucrose

Explanation:

Immediate source of energy for muscle contraction is ATP.

Q.35 In skeletal muscle under anaerobic conditions ATP can be generate by:

- A) Krebs cycle
B) ETC
C) Glycolysis
D) Pyruvic acid oxidation

Explanation:

In skeletal muscle under anaerobic conditions ATP can be generate by glycolysis.

Q.36 The contraction of each muscle fiber is based on:

- A) All or none principle
B) All or one principle
C) All or two principle
D) All or three principle

Explanation:

The contraction of each muscle fiber is based on all or none principle.

Q.37 Sarcoplasmic reticulum is continuous system of sarco-tubules extending throughout the sarcoplasm around the:

- A) Muscle fibers
B) Sarcomere
C) Myofibrils
D) Thick filaments

Explanation:

Sarcoplasmic reticulum is continuous system of sarco-tubules extending throughout the sarcoplasm around the myofibril.

Q.38 When muscles are used actively, capillaries surrounding the muscle fibres, as well as mitochondria within them increase in number and fiber synthesizes more:

- A) Glycogen
B) Calcium
C) Hemoglobin
D) Myoglobin

Explanation:

When muscles are used actively, capillaries surrounding the muscle fibres, as well as mitochondria within them increase in number and fiber synthesizes more myoglobin.

Q.39 Triceps and biceps are examples of:

- A) Smooth muscles
B) Skeletal muscles
C) Cardiac muscles
D) Antagonistic muscles

Explanation:

Triceps and biceps are examples of antagonistic muscles.

Q.40 Each light band of sarcomere is called:

- A) A band
B) I band
C) H zone
D) Z line

Explanation:

Each light band of sarcomere is called I band.

Q.41 Term Zwischen stands for:

- A) Bright
C) Top

B) Between

D) Bottom

Explanation:

Term Zwischen stands for between.

Q.42 Myofilament is made up of:

A) Actin filament only

C) Thin filament only

B) Thick filament only

D) Thick and thin filament both

Explanation:

Myofilament is made up of thick and thin filament both.

Q.43 _____ is the end of muscle which remain fixed when muscle contracts:

A) Insertion

C) Belly

B) Origin

D) Tendon

Explanation:

Origin is the end of muscle which remain fixed when muscle contracts.

Q.44 The actin molecule has _____ chains:

A) Two

C) Four

B) Three

D) Five

Explanation:

The actin molecule has two chains.

Q.45 When muscle is required to contract calcium ions bind with?

A) Actin

C) Troponin

B) Myosin

D) Tropomyosin

Explanation:

When muscle is required to contract calcium ions bind with troponin.

Q.46 _____ is needed to break the link between the myosin bridge and the actin:

A) NAD

C) Calcium

B) ATP

D) Myoglobin

Explanation:

ATP is needed to break the link between the myosin bridge and the actin.

Q.47 Sarcolemma is present around:

A) Myofilament

C) Muscle cell

B) Myofibril

D) Muscle bundle

Explanation:

Sarcolemma is present around myofibril.

Q.48 Once the myosin head has become attached to the _____ filament, ATP is hydrolyzed:

A) Tropomyosin

C) Actin

B) Thin

D) Troponin

Explanation:

Once the myosin head has become attached to the actin filament, ATP is hydrolyzed.

Q.49 It refers to a condition of the body after death, which is characterized by stiffness of body?

A) Cramp

C) Rigor mortis

B) Tetany

D) Spasm

Explanation:

Rigor mortis refers to a condition of the body after death, which is characterized by stiffness of body.

Q.50 Stimulation of a muscle fiber by a motor neuron occurs at:

- A) The neuromuscular junction C) The myofibril
B) The transverse tubules D) The sarcoplasmic reticulum

Explanation:

A neuron that transmits a stimulus to muscle tissue is called motor neuron. A motor unit consists of a single motor neuron (nerve cell) and the muscle fibres it innervates. The portion of the muscle plasma membrane (sarcolemma) that lies beneath the nerve endings (axon terminals) is called the motor end plate. The axon terminals and the motor end plate together constitute the neuro-muscular junction or neuromotor junction.

THE XCHHER
COPY 2020

STEP ENTRY TEST 2020