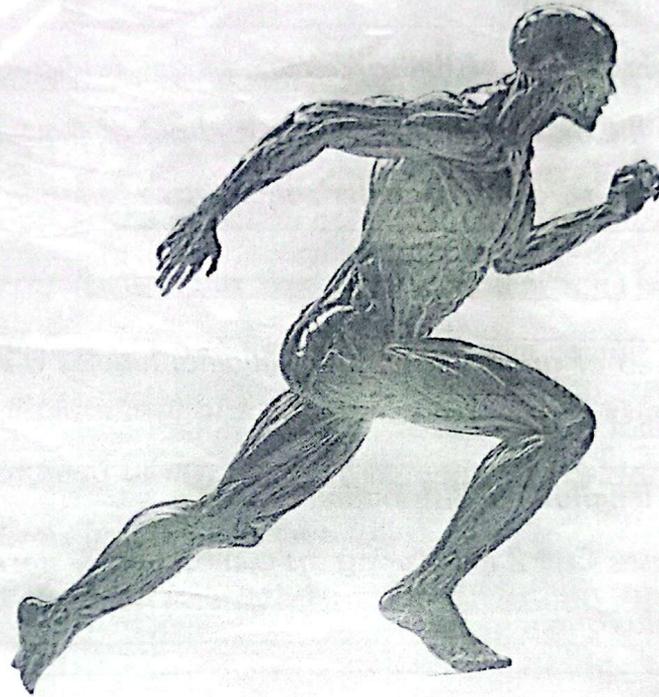
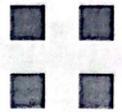


# MSS

6  
Price

LEVEL 1  
SEM 2



**Physiology**  
*DR. MM*



**L3 MCQ**

## Written physio 3

### ▪ Mention structure and Function of T- tubule ? \*\*\*

<b>Structure:</b>	<ul style="list-style-type: none"> <li>• Tubular extensions of sarcolemma at the junction of A-I band which is continuous with ECF.</li> </ul>
<b>Function:</b>	<ol style="list-style-type: none"> <li>1. ↑ <b>surface area</b> of the sarcolemma many folds.</li> <li>2. Help the <b>movement of ions</b> into and out of the cell.</li> <li>3. Help the <b>spread of depolarization wave</b> to inside of ms fiber.</li> </ol>

### ▪ Mention structure and Functions of sarcoplasmic reticulum ?

<b>Structure:</b>	<ul style="list-style-type: none"> <li>• Formed of anastomosing longitudinal tubules with two terminal cisterns</li> </ul>
<b>Function:</b>	<ol style="list-style-type: none"> <li>1. Help <b>longitudinal distribution</b> of ions</li> <li>2. Releases <b>Ca<sup>+2</sup> ions</b> during ms contraction &amp; stores it during ms relaxation.</li> </ol>

**N.B.: Sarco-tubular system include: T-tubule and sarcoplasmic reticulum**

### ▪ Def sarcomere and its structure ? \*\*

<b>Def:</b>	<ul style="list-style-type: none"> <li>• It is the part of the myofibril present between the 2 Z lines , functional unit of the muscle.</li> </ul>
<b>Structure:</b>	<ul style="list-style-type: none"> <li>• <b>Thick filament:</b> myosin</li> <li>• <b>Thin filament:</b> <ol style="list-style-type: none"> <li>a) Actin.</li> <li>b) Troponin: T (bind to tropomyosin), I (bind to actine), C (bind to Ca)</li> <li>c) Tropomyosin: act as relaxing protein, cover myosin binding site on actin</li> </ol> </li> </ul>

**Mention changes that occur in sarcomere during ms contraction ? \*\***

- Two Z-line approximate to each other
- H zone shortens
- I band shortens
- A band constant

▪ **Def and Enumerate steps of excitation contraction coupling ?**

▪ **Mention role of Ca in ms contraction? \*\*\***

<b>Def:</b>	<ul style="list-style-type: none"><li>• Conversion of action potential into mechanical response by skms</li></ul>
<b>Steps:</b>	<ul style="list-style-type: none"><li>• Propagation of action potential and release of Ca</li><li>• Binding of Ca to troponin c: this form complex leading to displacement of tropomyosin from its blocking site, and binding of head of myosin to actine and cross bridge cycle.</li><li>• Cross bridge cycle (see later)</li><li>• Relaxation (see later)</li></ul>

▪ **Mention steps of cross bridge cycle? \*\*\***

- a) Binding: head of myosin bind to actin.
- b) Bending: sliding of the actin over myosin by help of ATP
- c) Detachment: decrease affinity () head of myosin and actine by help of ATP
- d) Return to original position

▪ **Def rigor mortis ? and mention other types of rigor ?**

- Ms stifness after death due to failure of detachment between actin and myosin due to depletion of ATP.
- Other types: Ca rigor, heat rigor.

▪ **Mention role of ATP in sk ms contraction and relaxation ? \*\***

- *In contraction: ATP is required for bending and detachment*
- *In relaxation: Reuptake of Ca into sarcoplasmic reticulum by Ca ATPase (active process require ATP).*

▪ **Mention function of sk ms ?**

- *Movement*
- *Maintain body posture by ms tone*
- *Maintain body temperature*

▪ Comparison () muscle types

<b>Feature</b>	<b>Skeletal Muscle</b>	<b>Smooth Muscle</b>	<b>Cardiac Muscle</b>
<b>Appearance</b>	Striated	No striations	Striated
<b>Regulation</b>	Nervous control	Nervous & hormonal control	Pacemaker cells by nervous & hormonal control
<b>Action potential</b>	<ul style="list-style-type: none"> <li>• Spike AP (no plateau).</li> <li>• Upstroke due to <math>Na^+</math> current.</li> <li>• <b>Duration:</b> ➤ 1 msec</li> </ul>	<ul style="list-style-type: none"> <li>• Spike AP (no plateau).</li> <li>• Upstroke due to <math>Ca^{2+}</math> current.</li> <li>• <b>Duration:</b> ➤ 10 msec</li> </ul>	<ul style="list-style-type: none"> <li>• AP with plateau (due to inward <math>Ca^{2+}</math> current).</li> <li>• Upstroke due to <math>Na^+</math> current.</li> <li>• <b>Duration:</b> ➤ 150 msec in atria ➤ 300 msec in ventricles</li> </ul>
<b>Regulatory proteins</b>	Troponin	Calmodulin	Troponin
<b>Source of <math>Ca^{2+}</math> ***</b>	<ul style="list-style-type: none"> <li>• SR</li> </ul>	<ul style="list-style-type: none"> <li>• ECF (80%)</li> <li>• SR (20%)</li> </ul>	<ul style="list-style-type: none"> <li>• ECF (20%)</li> <li>• SR (80%)</li> </ul>
<b>Speed of contraction</b>	Fast to slow	Very slow	Slow

## MCQ notes L3

- One of functions of sk ms is maintenance of body temperature
- Ms fiber or cell is the structural unit of s kms , diameter is 10-100 um
- T-tubule :
  - Tubular extension of sarcolemma , continuous with ECF
  - Help spread of depolarization wave to the interior of ms
- Terminal cistern of SR store Ca , release it during contraction
- Triad is 2 terminal cistern with T-tubule in between
- Myofibril is longitudinal fibers extend from one end to other end of ms fiber , diameter 1 um
- Sarcomere :
  - Functional unit of s kms
  - Distance () 2 Z-lines
- Thick filament is myosin , while thin filament is actine , tropoinin , tropomyosin
- Cross bridge is component of myosin
- Head of myosin contain ATP binding site , actine binding site
- Rigor mortis is stiffness of ms due to failure of detachment due to depletion of ATP after death
- Malignant hyperthermia is genetic mutation in ryanodine receptor
- Regulatory protein of sk and cardiac ms is troponin while smooth ms is calmodulin
- Source of Ca for smooth ms and cardiac mss is ECF and SR , while sk ms from SR.
- NO tetanus in cardiac ms

## MCQ L3

<p><b>1. Which of the following is responsible for the depolarization phase in skeletal muscle?</b></p> <ul style="list-style-type: none"><li>a) Sodium influx</li><li>b) Sodium efflux.</li><li>c) Potassium influx</li><li>d) Potassium efflux</li><li>e) Calcium influx</li></ul>	<b>A</b>
<p><b>2. What is the resting membrane potential of skeletal muscle fiber?</b></p> <ul style="list-style-type: none"><li>A. -70 mv</li><li>B. +130 mv</li><li>C. +90 mv</li><li>D. -90 mv</li><li>E. +50 mv</li></ul>	<b>D</b>
<p><b>3. Role of Ca<sup>++</sup> ions excitation contraction coupling:</b></p> <ul style="list-style-type: none"><li>a) Binding of Ca<sup>++</sup> ions with troponin cause tropomyosin to move away exposing the binding sites present on actin molecules.</li><li>b) Muscle relaxation occurs so long as Ca<sup>++</sup> ions combine with troponin.</li><li>c) Ca<sup>++</sup> ions make tropomyosin to move and cover the binding sites on acting</li><li>d) Binding of Ca<sup>++</sup> ions with myosin heads. Leads to cross bridge cycling</li><li>e) Propagation of action potential to release of Ca<sup>++</sup> ions from T tubules.</li></ul>	<b>A</b>
<p><b>4. Which of the following is a function of tropomyosin in skeletal muscles?</b></p> <ul style="list-style-type: none"><li>a. Acting as a relaxing protein at rest.</li><li>b. Binding to myosin during contraction.</li><li>c. Generating ATP and providing it to the contractile proteins</li><li>d. Releasing Ca<sup>++</sup> from the sarcoplasmic reticulum.</li><li>e. Sliding on actin to produce shortening.</li></ul>	<b>A</b>

The function.  
 a. Binding to  
 b. Acting on

<p><b>5. About Sarcomere, which of the following statements is correct?</b></p> <p>A. Consisted of one transverse tubule and 2 terminal cisterne</p> <p>B. Contains thick myofilaments only</p> <p>C. includes a whole I band and two halves of A band on each side.</p> <p>D. is the area that has between two A band.</p> <p>E. Represent the functional contractile unit of skeletal myofibrils</p>	<p>E</p>
<p><b>6. Which of the following is a character of Malignant Hyperthermia?</b></p> <p>A. Excessive sweating</p> <p>B. Vasodilation</p> <p>C. Production of Cytokines</p> <p>D. Massive increase in metabolic rate</p> <p>E. Brown fat thermogenesis</p>	<p>D</p>
<p><b>7. Excitation contraction coupling involves all the following except</b></p> <p>a. release of <math>Ca^{+2}</math> from troponin.</p> <p>b. formation of cross bridges between actin and myosin.</p> <p>c. spread of depolarization along the transverse tubules.</p> <p>d. hydrolysis of ATP to ADP.</p>	<p>A</p>
<p><b>8. In skeletal muscle, which of the Following events occurs before depolarization of the T tubules in the mechanism of excitation-contraction coupling?</b></p> <p>a) Depolarization of the sarcolemmal membrane.</p> <p>b) Opening of <math>Ca^{++}</math> release channels on the sarcoplasmic reticulum (SR).</p> <p>c) Uptake of <math>Ca^{++}</math> into the SR by <math>Ca^{++}</math> adenosine triphosphatase (ATPase).</p> <p>d) Binding of <math>Ca^{++}</math> to troponin C (e) Binding of actin and myosin.</p> <p>e) Cross bridging of actin over myosin.</p>	<p>A</p>

<p><b>The function of Tropomyosin in skeletal muscle include:</b></p> <ul style="list-style-type: none"> <li>a. Binding to myosin during contraction</li> <li>b. Acting as a relaxing protein at rest by covering binding sites on actin.</li> <li>c. Sliding on actin shortening to produce</li> <li>d. Releasing <math>Ca^{++}</math> after propagation of action potential</li> <li>e. Reuptake of <math>Ca^{++}</math> during muscle relaxation</li> </ul>	<b>B</b>
<p><b>10. Among the steps of skeletal muscle relaxation:</b></p> <ul style="list-style-type: none"> <li>a. Binding of cross bridges to actin</li> <li>b. Pumping of <math>Ca^{++}</math> back into the sarcoplasmic reticulum.</li> <li>c. Binding of <math>Ca^{++}</math> to troponin C.</li> <li>d. inward spread of the depolarization waves along the transverse tubules.</li> <li>e. Binding of <math>Ca^{++}</math> to troponin C.</li> </ul>	<b>B</b>
<p><b>11. Functions of skeletal muscles include:</b></p> <ul style="list-style-type: none"> <li>a. Regulation of food intake</li> <li>b. Regulation of arterial blood pressure</li> <li>c. Regulation of body temperature</li> <li>d. Regulation of urine formation</li> <li>e. Regulation of blood glucose level</li> </ul>	<b>C</b>
<p><b>12. The myosin head contain:</b></p> <ul style="list-style-type: none"> <li>a. AMP binding sites</li> <li>b. ATP binding sites</li> <li>c. ADP binding sites</li> <li>d. GTP binding sites</li> </ul>	<b>B</b>
<p><b>13. The main protein that form the thick muscle protein is:</b></p> <ul style="list-style-type: none"> <li>a. troponin</li> <li>b. tropomyosin</li> <li>c. actin</li> <li>d. myosin</li> </ul>	<b>D</b>

<p><b>14. One of the following is NOT a protein that forms the thin muscle protein is:</b></p> <ul style="list-style-type: none"> <li>a. troponin C</li> <li>b. tropomyosin</li> <li>c. actin</li> <li>d. myosin</li> <li>e. troponin T</li> </ul>	<p><b>D</b></p>
<p><b>15. Cross bridges of sarcomere in skeletal muscles are made up of:</b></p> <ul style="list-style-type: none"> <li>a. actin.</li> <li>b. troponin.</li> <li>c. tropomyosin.</li> <li>d. myosin.</li> </ul>	<p><b>D</b></p>
<p><b>16. The T tubule:</b></p> <ul style="list-style-type: none"> <li>a) helps in longitudinal distribution of fluids, ions and substances synthesized within the sarcoplasm or mitochondria.</li> <li>b) releases Ca ions during muscle contraction and store it during ms relaxation.</li> <li>c) runs parallel to the myofibrils.</li> <li>d) transmits chemical substances from the nerve to the muscle.</li> <li>e) allows the depolarization wave to pass rapidly inside the muscle fiber to activate deep myofibrils.</li> </ul>	<p><b>E</b></p>
<p><b>17. The Sarcomere:</b></p> <ul style="list-style-type: none"> <li>a. is the distance between myasin and actin.</li> <li>b. is the distance between two 2 H zones.</li> <li>c. is the cause of the cross striation of the skeletal muscle.</li> <li>d. does not shorten when the muscle contracts.</li> <li>e. is the part of the myofibril present between the 2 Z discs.</li> </ul>	<p><b>E</b></p>

3. The myofib.  
a) are about  
b) extend fra

<p><b>8. The myofibrils:</b></p> <p>a) are about 10 um in diameter</p> <p>b) extend from one end of the muscle fiber to the other giving the muscle fiber its longitudinal striation.</p> <p>c) the thick filaments contain the contractile protein actin, troponin and tropomyosin.</p> <p>d) the thin filaments contain the contractile protein myosin.</p> <p>e) each sarcomere contains two sets of thick filaments, one at each end.</p>	<b>B</b>
<p><b>19. Relaxing protein is:</b></p> <p>a. Myosin</p> <p>b. Actin</p> <p>c. H-zone</p> <p>d. Tropomyosin</p> <p>e. T. tubule.</p>	<b>D</b>
<p><b>20. As regard transverse tubules, all are true except:</b></p> <p>a. it increases the surface area of the cell membrane.</p> <p>b. it transmits action potential to inside the fiber.</p> <p>c. it acts as <math>Ca^{+2}</math> stores.</p> <p>d. it's absent in smooth muscle fibers.</p>	<b>C</b>
<p><b>21. The action potential of skeletal muscles:</b></p> <p>a. has a prolonged plateau phase.</p> <p>b. spreads inwards to all parts of the muscle via T tubules.</p> <p>c. is longer than the action potential in the cardiac muscle.</p> <p>d. causes reuptake of <math>Ca^{+2}</math> into terminal cisternae.</p>	<b>B</b>
<p><b>22. During muscle contraction, all the following is true except:</b></p> <p>a) the binding sites at the actin filament are activated by <math>Ca^{+2}</math>.</p> <p>b) the walk along theory of contraction assumes that sliding of actin continues as long as <math>Ca^{+2}</math> is attached to troponin C.</p> <p>c) detachment of myosin heads from actin needs binding of ATP molecule</p> <p>d) the transverse tubules (T.T) become filled with intracellular fluid.</p>	<b>D</b>

Among  
 a) Gener  
 b) Sprea

<p><b>23. In skeletal muscles, all the following is true except:</b></p> <ul style="list-style-type: none"> <li>a. tropomyosin is found in the thin filaments.</li> <li>b. myosin is found in the thick filaments.</li> <li>c. the lateral sacs of sarcoplasmic reticulum are rich in <math>Ca^{+2}</math>.</li> <li>d. troponin C molecules bind <math>Ca^{+2}</math>.</li> <li>e. energy from ATP is not required for muscle relaxation.</li> </ul>	<p><b>E</b></p>
<p><b>24. Excitation-contraction coupling in skeletal muscles involves all the following events except one. Which one is this exception?</b></p> <ul style="list-style-type: none"> <li>a. ATP hydrolysis.</li> <li>b. binding of <math>Ca^{+2}</math> to calmodulin.</li> <li>c. conformational change in dihydropyridine receptor.</li> <li>d. depolarization of the transverse tubule (T-tubule) membrane,</li> <li>e. increased <math>Na^{+}</math> conductance of sarcolemma.</li> </ul>	<p><b>B</b></p>
<p><b>25. A single contraction of skeletal muscle is most likely to be terminated by which of the following actions?</b></p> <ul style="list-style-type: none"> <li>a. closure of post-synaptic nicotinic acetylcholine receptors.</li> <li>b. removal of acetylcholine from the neuro-muscular junction.</li> <li>c. removal of <math>Ca^{+2}</math> from the terminal of the motor neuron.</li> <li>d. removal of sarcoplasmic <math>Ca^{+2}</math>.</li> <li>e. return of the dihydropyridine receptor to its resting conformation.</li> </ul>	<p><b>D</b></p>
<p><b>26. In skeletal muscles, the transverse tubules and adjacent cisterns consulate?</b></p> <ul style="list-style-type: none"> <li>a) A triad.</li> <li>b) The sarcolemma.</li> <li>c) A myofibril</li> <li>d) A muscle fiber.</li> <li>e) The sarcomere.</li> </ul>	<p><b>A</b></p>

<p><b>27. Among the Steps of muscles contraction one of the following is wrong</b></p> <ul style="list-style-type: none"> <li>a) Generation of an action potential.</li> <li>b) Spread of depolarization into the muscle fibers via the T system.</li> <li>c) Release of <math>Ca^{++}</math> from the sarcoplasmic reticulum.</li> <li>d) Release of K from troponin T.</li> <li>e) formation of cross linkages between actin and myosin.</li> </ul>	<b>D</b>
<p><b>28. Which of the following temporal sequences is correct for excitation-contraction coupling in skeletal muscle?</b></p> <ul style="list-style-type: none"> <li>a) Increased intracellular <math>[Ca^{++}]</math>: action potential in the muscle membrane; cross-bridge formation.</li> <li>b) Action potential in the muscle membrane, depolarization of the T tubules; release of <math>Ca^{++}</math> from the sarcoplasmic reticulum (SR).</li> <li>c) Action potential in the muscle membrane; splitting of adenosine triphosphate (ATP); binding of <math>Ca^{++}</math> to troponin C.</li> <li>d) Release of <math>Ca^{++}</math> from the SR, depolarization of the T tubules; binding of <math>Ca^{++}</math> to troponin C</li> </ul>	<b>B</b>
<p><b>29. One of the following is wrong:</b></p> <ul style="list-style-type: none"> <li>a) Tight gap junctions are absent in skeletal muscles and present in smooth muscles.</li> <li>b) Skeletal muscles don't obey the all or none law while visceral smooth muscles do.</li> <li>c) A motor unit is a single motor neuron and all muscle fibers innervated by it.</li> <li>d) The smooth muscle contracts when stretched in absence of extrinsic nerves.</li> <li>e) All types of muscle contract when <math>Ca^{++}</math> is taken up by sarcoplasmic reticul.</li> </ul>	<b>E</b>

The prop  
 a) the relea  
 b) contr

<p><b>30. The following characteristics are present in both skeletal &amp; smooth muscles:</b></p> <ul style="list-style-type: none"> <li>a) The myofibrils in both have Z membranes.</li> <li>b) Both initiate spontaneous rhythmic contractions.</li> <li>c) Both contain actin and myosin and show tonic (partial) contraction at rest.</li> <li>d) Both can be affected by hormones and chemicals equally.</li> <li>e) Both have T tubules.</li> </ul>	<p><b>C</b></p>
<p><b>31. The function of troponin C is:</b></p> <ul style="list-style-type: none"> <li>a) binding with <math>Ca^{++}</math>.</li> <li>b) binding with the tropomyosin.</li> <li>c) binding with actin.</li> <li>d) covering active sites of actin.</li> <li>e) binding with the myosin head.</li> </ul>	<p><b>A</b></p>
<p><b>32. Which of the following is correct:</b></p> <ul style="list-style-type: none"> <li>a) RMP is the signal used by the CNS.</li> <li>b) the RMP of a neuron is 70 volts.</li> <li>c) depolarization phase of AP is due to <math>Na^+</math> efflux.</li> <li>d) neuromuscular transmission is stimulated by curare.</li> <li>e) during depolarization phase of an AP , permeability to <math>Na^+</math> increases.</li> </ul>	<p><b>E</b></p>
<p><b>33. During skeletal muscle contraction:</b></p> <ul style="list-style-type: none"> <li>a) ATP ase activity of myosin head is inhibited.</li> <li>b) tropomyosin covers the active site of actin.</li> <li>c) attachment, tilting, and detachment cycling occurs between myosin head and actin.</li> <li>d) <math>Ca^{++}</math> needed to start contraction comes from T-tubules.</li> <li>e) <math>Ca^{++}</math> needed to start contraction comes from ECF.</li> </ul>	<p><b>C</b></p>

<p><b>34. The propagation of AP along the membrane of the T-tubules causes:</b></p> <ul style="list-style-type: none"> <li>a) the release of NE from the terminal cisternae.</li> <li>b) contraction of the T- tubules.</li> <li>c) the release of Ach from the terminal cisternae.</li> <li>d) the pumping of <math>Ca^{++}</math> back into the sarcoplasmic reticulum.</li> <li>e) the release of <math>Ca^{++}</math> from the terminal cisternae.</li> </ul>	<b>E</b>
<p><b>35. Excitation-contraction coupling in the skeletal muscles involves:</b></p> <ul style="list-style-type: none"> <li>a) binding of <math>Ca^{++}</math> to tropomyosin.</li> <li>b) binding of <math>Ca^{+}</math> to myosin head.</li> <li>c) release of <math>Ca^{++}</math> from T-tubules.</li> <li>d) attachment of myosin head to the active site of actin.</li> <li>e) cleavage of ATP by G-protein.</li> </ul>	<b>D</b>
<p><b>36. Depolarization in smooth muscles is mainly due to:</b></p> <ul style="list-style-type: none"> <li>a) <math>Na^{+}</math> inflow.</li> <li>b) <math>K^{+}</math> outflow.</li> <li>c) <math>Ca^{++}</math> inflow.</li> <li>d) <math>Ca^{++}</math> outflow.</li> <li>e) <math>Na^{+}</math> outflow.</li> </ul>	<b>C</b>
<p><b>37. Smooth muscle does not contain:</b></p> <ul style="list-style-type: none"> <li>a) troponin.</li> <li>b) myosin.</li> <li>c) tropomyosin.</li> <li>d) calmodulin.</li> <li>e) actin.</li> </ul>	<b>A</b>
<p><b>38. Depolarization in smooth muscle:</b></p> <ul style="list-style-type: none"> <li>a) is caused by <math>Na^{+}</math> entry.</li> <li>b) requires calmodulin.</li> <li>c) is cause by <math>Ca^{++}</math> entry.</li> <li>d) is faster than that in skeletal muscle.</li> <li>e) is due to <math>Ca^{+}</math> outflow.</li> </ul>	<b>C</b>

These  
A. A,D,B,C  
B. D

<p><b>39. Which of the following is correct:</b></p> <ul style="list-style-type: none"> <li>a) all smooth muscles have a stable RMP.</li> <li>b) myasthenia gravis is due to loss of ATP.</li> <li>c) troponin I is attached to actin.</li> <li>d) troponin C is attached to tropomyosin.</li> <li>e) troponin I is attached to tropomyosin.</li> </ul>	C
<p><b>40. At the motor end plate, acetylcholine causes the opening of:</b></p> <ul style="list-style-type: none"> <li>a. Na channels and depolarization towards the Na<sup>+</sup> equilibrium potential</li> <li>b. K<sup>+</sup> channels and depolarization towards the K<sup>+</sup> equilibrium potential</li> <li>c. Ca<sup>++</sup> channels and depolarization towards the Ca<sup>++</sup> equilibrium potential</li> <li>d. Na<sup>+</sup> &amp; K<sup>+</sup> channels and depolarization of muscle membrane</li> </ul>	D
<p><b>41. The skeletal muscle fiber (cell):</b></p> <ul style="list-style-type: none"> <li>a. During rest its inside is +ve relative to outside</li> <li>b. Contains rich intracellular store of Ca</li> <li>c. Is normally innervated by more than one motor neuron</li> <li>d. Becomes less excitable when its resting membrane potential is decreased</li> </ul>	B
<p><b>42. In the motor end plate, all the following is true except:</b></p> <ul style="list-style-type: none"> <li>a. The Ach receptors are similar to those in smooth muscles</li> <li>b. The nerve ending contain many vesicles and mitochondria</li> <li>c. Lack of Ca diminishes the release of Ach</li> <li>d. There is a high concentration of cholinesterase enzyme</li> <li>e. There is delay of neuromuscular transmission about 0.5-0.7 msec</li> </ul>	A
<p><b>43. events occur as part of the process of skeletal muscle contraction:</b></p> <ul style="list-style-type: none"> <li>A. Depolarization of the transverse tubules</li> <li>B. Ca<sup>++</sup> release by the sarcoplasmic reticulum</li> <li>C. Increased permeability of the muscle cell membrane to Na<sup>+</sup> and K<sup>+</sup></li> <li>D. Binding of acetyl choline to the muscle cell membrane</li> </ul>	C

<p>▪ <u>These events occur in which of the following sequences?</u></p> <p>A. A,D,B,C</p> <p>B. D,A,C,B</p> <p>C. D,C,A,B</p> <p>D. D,C,B,A</p>	
<p><b>44. The ATPase activity of which of the following proteins is altered to regulate skeletal muscle contraction?</b></p> <p>a. Actin.    B. Myosin.</p> <p>c. Troponin.    D. Tropomyosin.</p> <p>e. Calmodulin.</p>	<b>B</b>
<p><b>45. Rigors mortis is due to:</b></p> <p>a. Failure of detachment between actin and myosin</p> <p>b. Excessive release of Ca<sup>++</sup> from SR</p> <p>c. Damage of troponin protein molecules.</p> <p>d. Lack of binding sites of myosin on actin</p> <p>e. Failure of propagation of action potential along muscle fibres</p>	<b>A</b>
<p><b>46. During muscle contraction: زيادت المحضره</b></p> <p>a) the A bands remain constant.</p> <p>b) the Z lines move further apart.</p> <p>c) the tropomyosin molecules remain in place.</p> <p>d) the bands are elongated.</p> <p>e) the H zones become wider.</p>	<b>A</b>
<p><b>47. A cross sectional view of a skeletal muscle fiber through the H zone would reveal the presence of what? زيادت المحضره</b></p> <p>a. actin and fitin.</p> <p>b. actin but no myasin.</p> <p>c. actin, myosin and fitin,</p> <p>d. myosin and actin.</p> <p>E. myosin but no actin.</p>	<b>E</b>

<p><b>48. Which of the following causes rigor in skeletal muscle?</b></p> <p>a) Lack of action potentials in motoneurons.  b) An increase in intracellular <math>Ca^{++}</math> level.  c) A decrease in intracellular <math>Ca^{++}</math> level  d) An Increase in adenosine triphosphate (ATP) level.  e) A decrease in ATP level.</p>	<b>E</b>
<p><b>49. In skeletal muscle, the: زيادات المحضره</b></p> <p>a) A bands are broader than the I bands and contain both actin and myosin.  b) H zones contain only actin and increase in width during contraction.  c) Z membranes are phase in the middle of the H zones.  d) I bands contain myosin only.  e) Sole feet at the motor end plate are myelinated branches of the nerve.</p>	<b>A</b>
<p><b>50. One of the following is not a character of sarcomere: زيادات المحضره</b></p> <p>a) It is the distance between 2Z membranes.  b) It is shortened during contraction.  c) The width of I band does not change during contraction.  d) The width of the A band does not change during contraction.  e) H-zone becomes narrower during contraction.</p>	<b>C</b>
<p><b>51. Which of the following decrease in length during contraction: زيادات المحضره</b></p> <p>a) A band of sarcomere.  b) I band of sarcomere.  c) Z disc of sarcomere.  d) Thick filament.  e) Thin Filament.</p>	<b>B</b>

<p><b>2. Detachment of head of myosin from actin molecules:</b></p> <ul style="list-style-type: none"> <li>a. Needs ADP molecules</li> <li>b. Due to reuptake of <math>Ca^{+2}</math> from SR</li> <li>c. needs ATP molecule</li> <li>d. due to release of <math>Ca^{+2}</math> from SR</li> <li>e. is a passive process</li> </ul>	<b>C</b>
<p><b>53. About the activity of skeletal muscles, one of the following is incorrect:</b></p> <ul style="list-style-type: none"> <li>a) Hypertrophy develops as a result of forced repeated contractions.</li> <li>b) The function of the T system is the rapid transmission of the action potential from the cell membrane to inside the muscle fiber.</li> <li>c) During the spike potential, the muscle excitability is normal.</li> <li>d) Acetylcholine released at the M.E.P. is rapidly hydrolyzed by cholinesterase.</li> <li>e) Pale muscle fibers show rapid fatigue.</li> </ul>	<b>C</b>
<p><b>54. Repeated stimulation of a skeletal muscle fiber causes a sustained contraction (tetanus). Accumulation of which solute in intracellular fluid is responsible for the tetanus (continuous contraction)?</b></p> <ul style="list-style-type: none"> <li>a) <math>Na^{+}</math></li> <li>b) <math>K^{+}</math></li> <li>c) <math>Cl^{-}</math></li> <li>d) <math>Mg^{++}</math></li> <li>e) <math>Ca^{++}</math></li> </ul>	<b>E</b>
<p><b>55. Calmodulin is structurally related to:</b></p> <ul style="list-style-type: none"> <li>a) Actin</li> <li>b) Myosin light chain</li> <li>c) Tropomyosin</li> <li>d) Troponin C</li> </ul>	<b>D</b>