Copy of Exam 4 - Results

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Attempt 1 of 3

Written Feb 28, 2024 10:18 AM - Feb 28, 2024 10:18 AM

Attempt Score **0 / 19 - 0 %**

Question 1

0 / 1 point

How does xylem sap flow from root to leaves in a 100 m tall tree?

- turgor pressure in the roots pushes water up
- sugar is actively transported into ever-higher cells and the water follows by osmosis
- The edges of the soil-to-leaf column of water creep up the walls of tubes, which pulls the column of water up
- contractile cells in the root contract and pump the water up
- the stretched surface of the soil-to-leaf column of water pulls the column up

Question 2

0 / 1 point

What is one reason the aerobic pathway for ATP synthesis is not well designed for a muscle cell that rapidly consumes ATP to drive ion pumps and cross-bridge cycle over a short duration

- ATP cannot be transported across the mitochondrial membranes
- the aerobic path requires glucose
- the diffusion time from the mitochondrial matrix to the cytoplasm is long
- ATP is completly hydrolyzed in the mitochondria
- glycolysis only transfers a small fraction of the total chemical energy in glucose to ATP

Question 3 **0 / 1 point**

Xylem vessels are a part of

- cortical tissue
- endodermal tissue
- epidermal tissue
- ground tissue
- vascular tissue

Question 4 **0 / 1 point**

A muscle fiber is

- a cell
- a bundle of muscle cells
- the dense connective tissue within a muscle
- a myofilament
- an organelle composed of thick and thin filaments

Question 5 **0 / 1 point**

In a relaxed muscle, which of the following is TRUE?

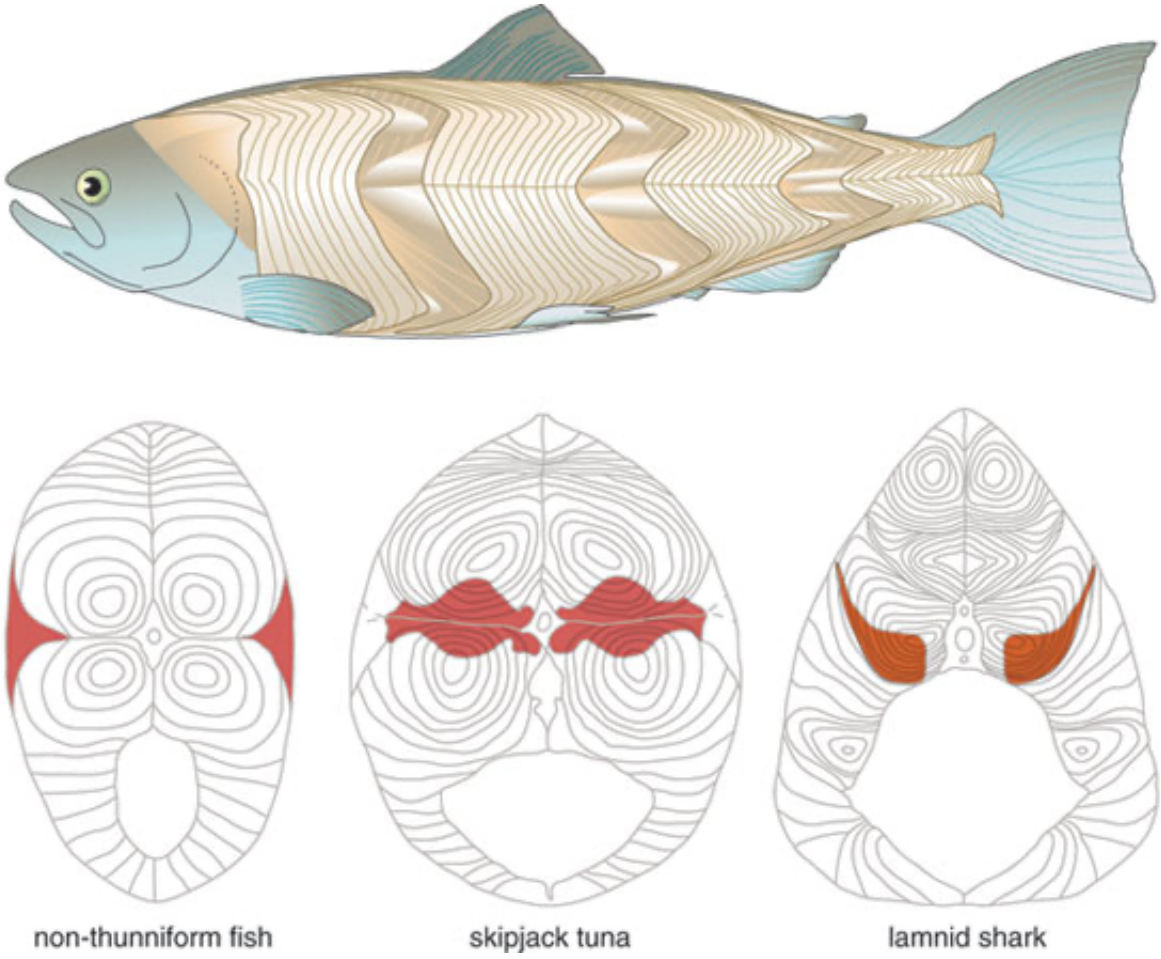
- myosin heads have hydrolyzed ATP and are in the high energy position
- Na+/K+ pumps are turned off
- Ca++ is bound to troponin
- myosin binding sites on actin are exposed
- sarcomeres are at their maximum length

Question 6 **0 / 1 point**

The transport of a fluid, including all substances in suspension or dissolved in the fluid, due to a pressure gradient is

- pressure potential
- osmosis
- bulk flow
- water potential
- turgor pressure

Question 7 **0 / 1 point**

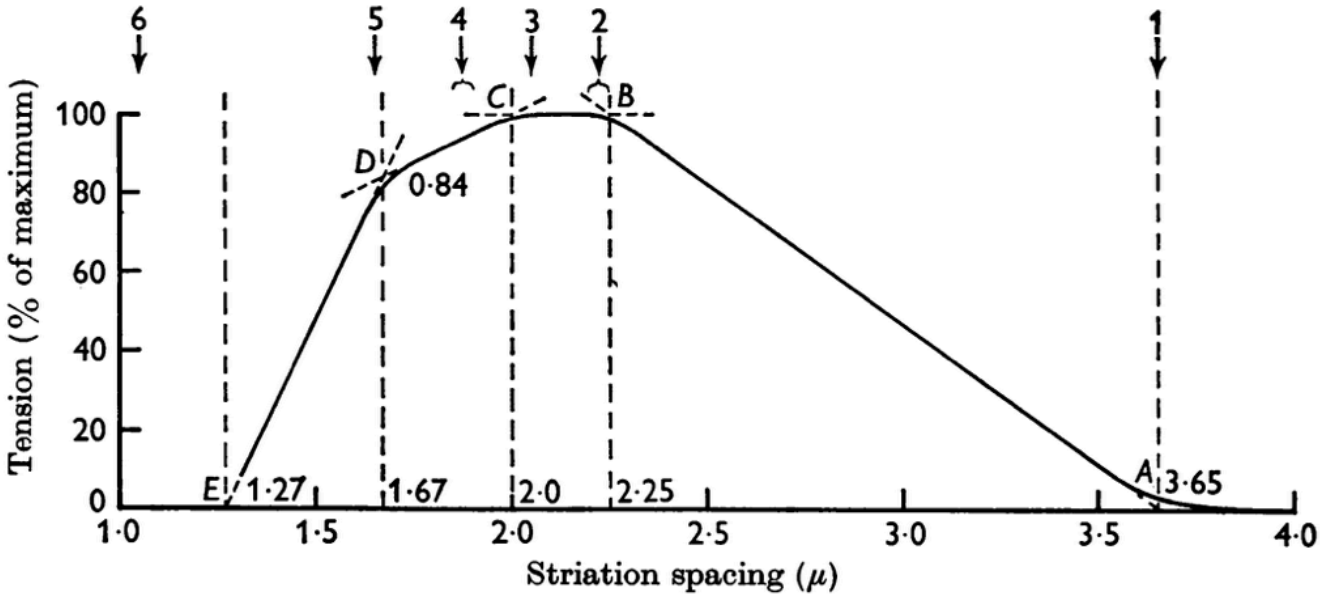


In the transverse sections of fish illustrated above, the stuff colored red is more interior. What is a consequence of this?

- the vessels are better protected and less likely to be injured
- the fish is able to generate higher accelerations
- a stiffer hydrostatic skeleton to transfer power to the muscle
- the fish is able to maintain body temperature well above that of the surrounding water
- the viscera (stomach, intestines, liver) are better protected and less likely to be injured

Question 8

0 / 1 point

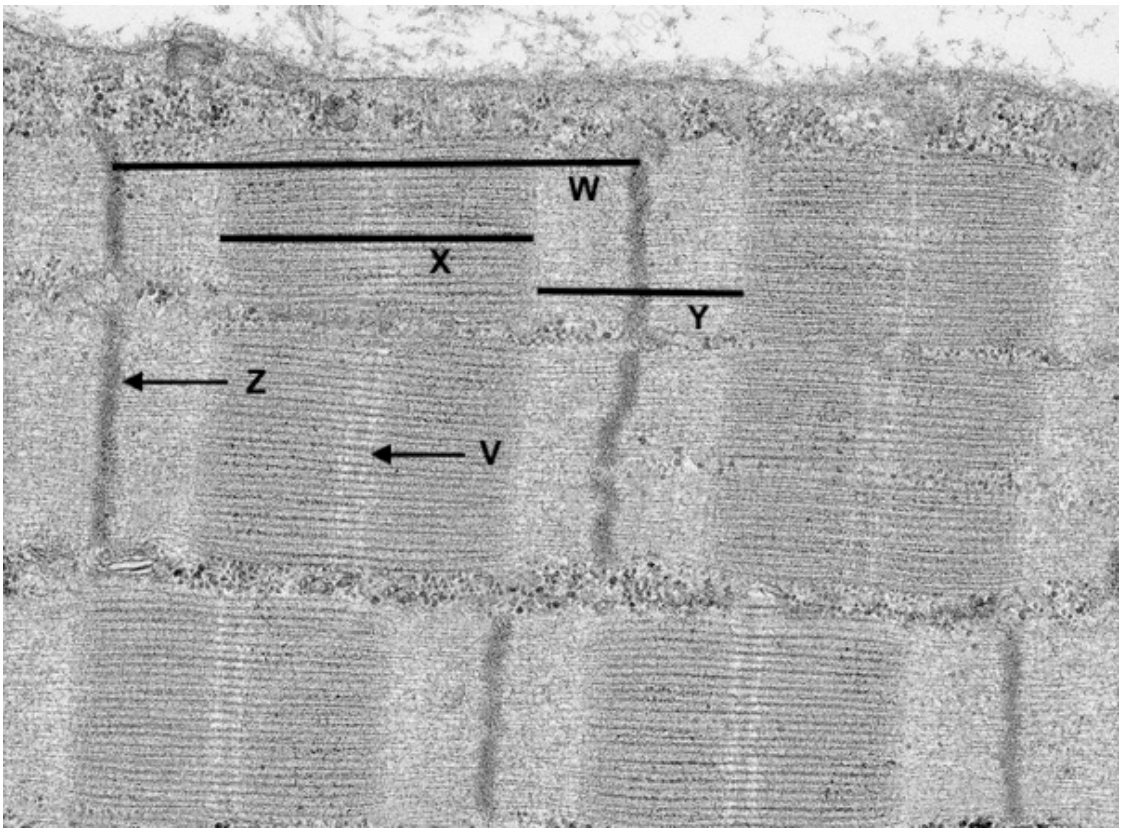


In the image above, why does the % of maximum tension increase as we move along the x-axis from 3.65 µ to 2.25 µ

- more myofibrils are stimulated
- each myosin head is generating more force
- the rate of muscle stimulation is increasing, so there is more Ca++ in the cytoplasm
- there is increased overlap between thin filaments and the section of thick filaments containing myosin heads
- more fibers are stimulated

Question 9

0 / 1 point



In muscle contraction (using the image above),

- The structure labeled X splits at V, with everything to the left of V sliding to the left, and everything on the right of V sliding to the right
- the width of Y lengthens
- The width of X shortens
- the width of X lengthens
- the Z on each side of W is pulled toward V

Question 10 **0 / 1 point**

Elite sprinters have locomotory muscles that generate more power, compared to elite distance runners. All of these contibute to increased power EXCEPT

- hypertrophied fibers
- higher rate of crossbridge cycling
- more myofibrils per cross-sectional area
- higher concentration of glycolytic enzymes
- myosin heads that pull on thin filaments with more force

Question 11 **0 / 1 point**

Myosin hydrolyzes ATP. The energy of this reaction is used to

- bind Ca++ to troponin
- create the Na+ gradient
- create the Ca++ gradient
- propogate the action potential down the t-tubule
- pivot the myosin head into the position where it can bind to actin

Question 12 **0 / 1 point**

[K+] in a root epidermal cell is 275 mMol. [K+] in the soil is 275 µMol. The cell membrane is permeable to K+. Which of the following is TRUE?

- there is not enough information to choose any of the other answers
- K+ will diffuse into the cell slowly
- K+ will diffuse into the cell rapidly
- K+ will diffuse out of the cell rapidly
- K+ will diffuse out the cell slowly

Question 13 **0 / 1 point**

Plants typically use what kind of pump to create a large, negative membrane potential?

- proton pump
- chloride pump
- calcium pump
- sodium-potassium pump
- bicarbonate pump

Question 14 **0 / 1 point**

myofilaments are located

- in the plasma membrane
- in the mitochondria
- in the cytoplasm
- in the extracellular matrix
- in the lumen of the sarcoplasmic reticulum

Question 15 **0 / 1 point**

Muscle that is working at a high rate consumes O2 at a high rate. What is the "rate of doing work" called?

- velocity
- force
- power
- mechanical energy
- kinetic energy

Question 16 **0 / 1 point**

troponin

- binds Ca++ , which pivots the myosin head to its high energy position
- binds Ca++ and moves tropomyosin, which allows myosin to bind to actin
- has exposed binding sites for myosin when Ca++ is bound to actin
- binds ATP, binds Ca++ and moves tropomyosin, which allows myosin to bind to actin
- binds Na+ and moves actin, which allows myosin to bind to tropomyosin

Question 17 **0 / 1 point**

If a plant cell immersed in distilled water has

$$\Psi_S = -7 \text{ MPa}$$

$$\Psi = 0 \text{ MPa}$$

what is the cell's

$$\Psi_P$$

- 49 MPa
- 7 MPa
- 0 MPa
- -7 MPa
- There is not enough informtion to choose any of the other answers

Question 18 **0 / 1 point**

Which of the following statements about the anaerobic pathway for ATP synthesis is TRUE?

- the pathway uses fatty acids as the initial substrate
- the pathway is very active in Type I muscle fibers
- the pathway produces more ATP than the aerobic pathway
- the pathway occurs when no O2 is present in the cell
- the pathway occurs in the cytoplasm

Question 19 **0 / 1 point**

In order for transpiration to work, air spaces in the leaf must be open to the external environment to allow water vapor to to escape. The guard cells that regulate this create an opening by

- protons are pumped out of the cell creating a large, negative membrane potential. The hyperpolarization moves K+ out of electrochemical equilibrium and K+ diffuses into the cell. The increased solute potential in the cell results in water diffusing into the cell, which increases turgor pressure and bends the cell, creating an opening
- protons are pumped out of the cell creating a large proton gradient that is used to transport sugar into the cell by secondary active transport. The increased solute potential in the cell results in water diffusing into the cell, which increases turgor pressure and bends the cell, creating an opening
- protons are pumped into the cell The increased solute potential in the cell results in water diffusing into the cell, which increases turgor pressure and bends the cell, creating an opening
- protons are pumped into the cell, which depolarizes the plasma membrane. The depolarization opens voltage-gated Ca++ channels. Ca++ diffuses into the cell and binds to and activates motor proteins that pull on the guard cell membrane, bending it into a shape that creates and opening.
- protons are pumped out of the cell creating a large, negative membrane potential. The hyperpolarization moves K+ out of electrochemical equilibrium and K+ diffuses out of the cell. The decreased solute potential in the cell results in water diffusing out of the cell, which makes the guard cell flaccid, which creates an opening

Done