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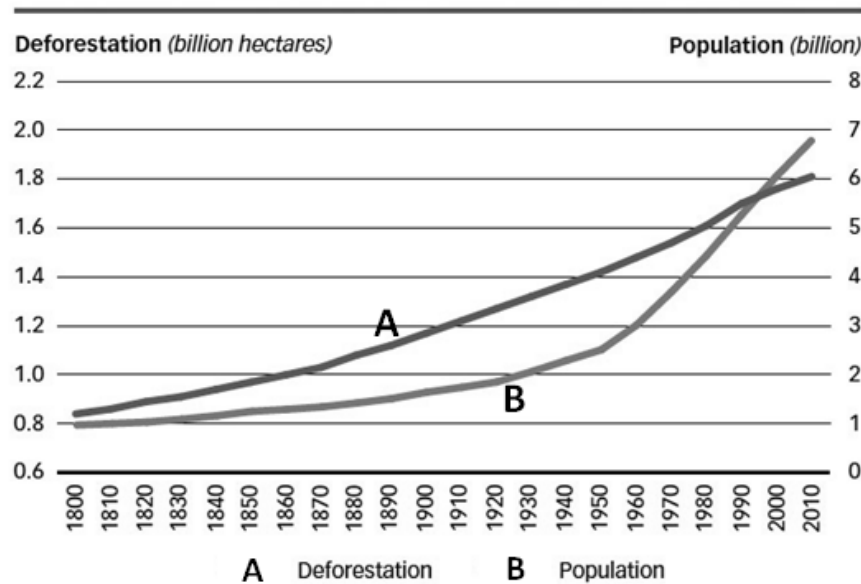
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Multiple Choice Questions (each number = 1 point)

1. Figure of world population and cumulative deforestation, 1800-2010.



Sources: Williams, 2002; FAO, 2010b; UN, 1999.

Deforestation rate has been slower than population growth since

- A. 1840
- B. 1920
- C. 1950
- D. 1990

2. A molecule of carbon dioxide leaves a muscle cell in your leg and enters the blood in a capillary bed. On its way to leaving the body via exhaled air, it passes through the following structures, EXCEPT ...

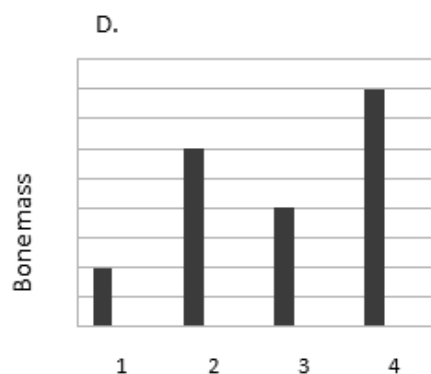
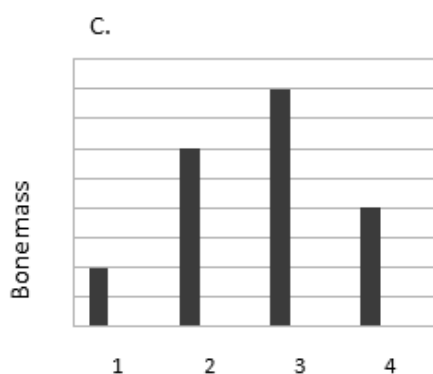
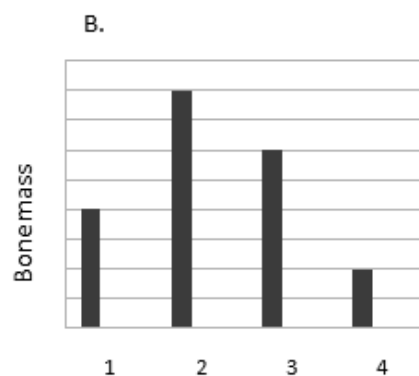
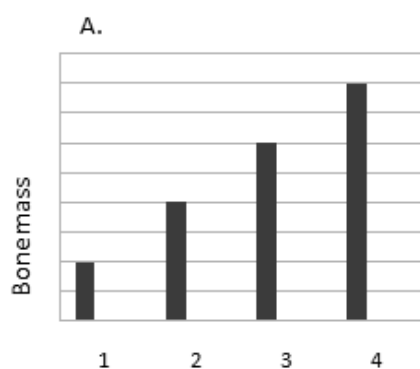
- A. The right atrium
- B. An alveolus
- C. A pulmonary vein
- D. A vena cava

3. In a creative experiment, grade five students examined effects of different kinds of packed fruit juice on chicken bone. They provide equal amount of different kinds of fruit juice and measure their pH with pH indicator. They collected the chicken bones, and put equal mass of chicken bone in each fruit juice for a month. To prevent juices evaporation they used suitable tight flasks. At the end of the time they measured the mass of each flask bone with a digital scale.

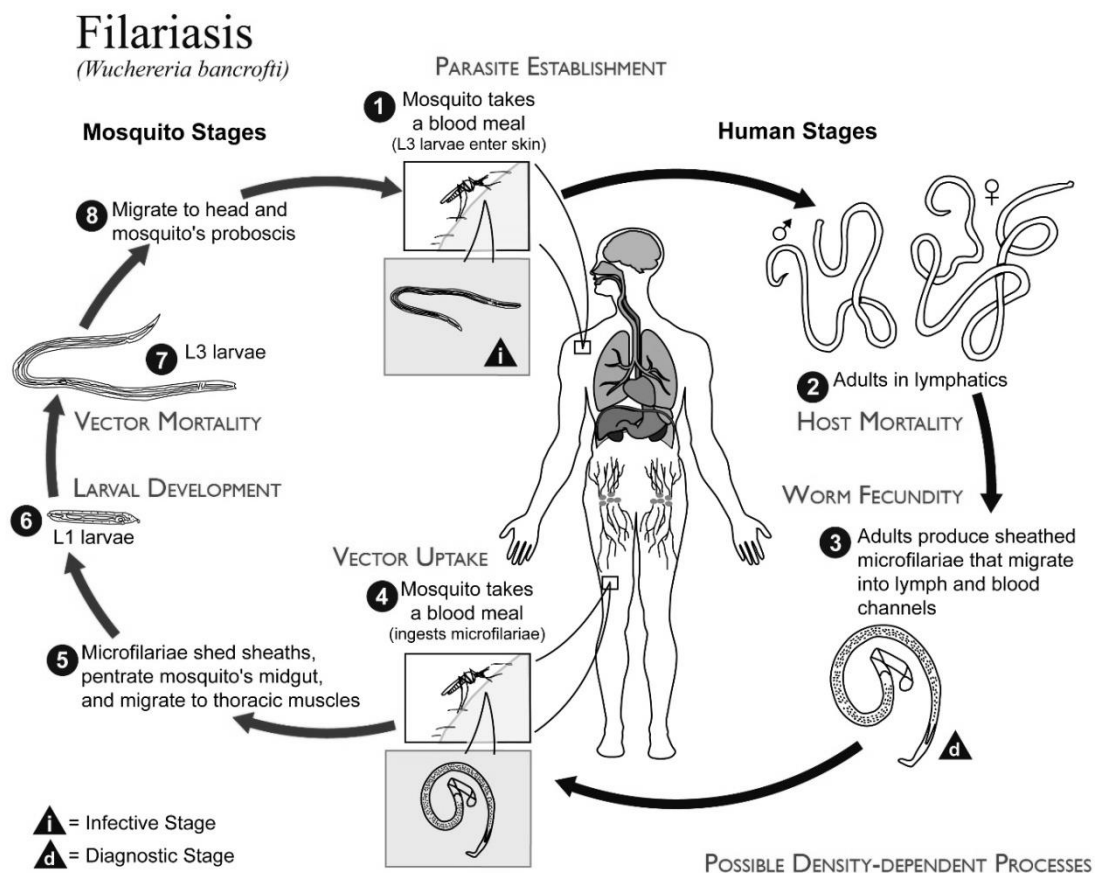
pH for each fruit juice is measured using pH indicator:

| Fruit juice 1 | Fruit juice 2 | Fruit juice 3 | Fruit juice 4 |
|---------------|---------------|---------------|---------------|
| 2 | 6 | 4 | 7.5 |

Due to the experiment, which diagram shows the chicken bones mass correctly?



4. Observed the picture below about Filariasis (Elephantiasis).



Which of the following statements is FALSE?

- A. Filariasis is a disease spread by a mosquito
- B. *Wuchereria bancrofti* can destruct human life cycle
- C. *Wuchereria bancrofti* clogs lymph vessel
- D. Filariasis will appear in human if an enlargement of leg is visible

5. Which of the following IS NOT a natural cloning?

- A. New organism of Planaria after its fragmentation.
- B. Process of making muscle cell from zygote
- C. New organism of star fish that grows from one part of its body.
- D. Binary fission in bacteria

6. The picture below shows **Liger**; hybridization of male lion and female tiger.



What is the main reason that Liger is not assumed as a new species?

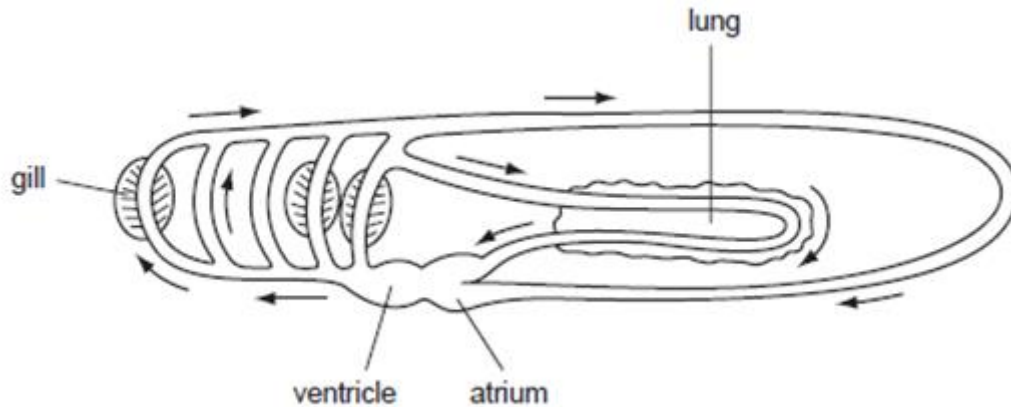
- A. Because liger still looks similar with lion and tiger
 - B. Because liger still has a parental characteristics
 - C. Because liger can only mating with another liger to produce an offspring
 - D. Because liger is a sterile organism and cannot produce any offspring
7. A biology teacher gave her students a culture of colourless unicellular organisms to study. The students observed that each cell was about 100 μm diameter, had a single nucleus, was rectangular in shape, and did not burst when placed in a hypotonic solution. There are some statements related to those explanations:
- i. They were bacteria
 - ii. They were eukaryotic.
 - iii. They were animal cells.
 - iv. They probably had a cell wall outside of the cell membrane.
 - v. The organisms were cells that normally grew in salt water.

Which statements about these organisms are supported by the observations?

- A. ii and v
- B. ii, iii, and iv
- C. ii, iii, and v
- D. ii and iv

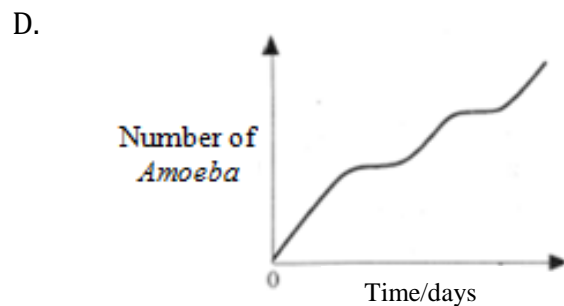
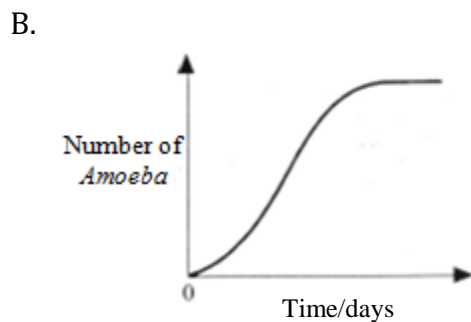
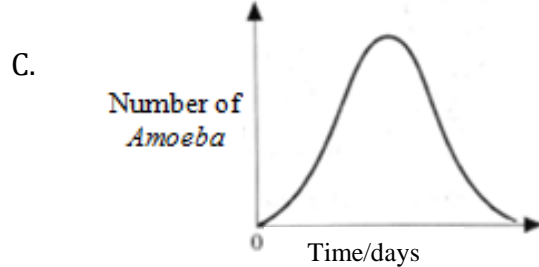
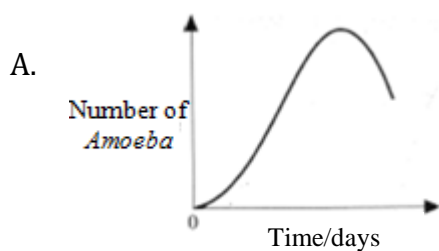
8. The human circulatory system is described as a closed circulation.

The picture shows the circulatory system in a different organism. The arrows show the direction of blood flow in the vessels.

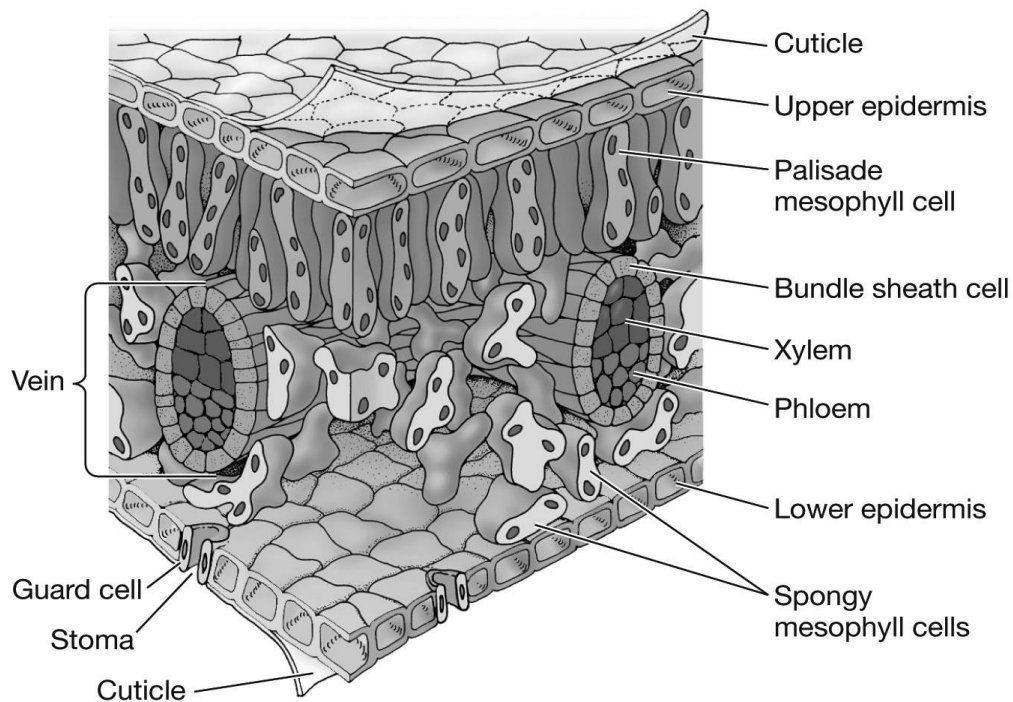


How is the circulatory system in this organism described ...

- A. Closed double system
 - B. Closed single system
 - C. Open double system
 - D. Open single system
9. In a culture of *Amoeba* in a laboratory, environmental condition is maintained constant at 29 °C and food is constantly added, while toxic waste is discarded. Which of the following graphs shows the pattern growth of that *Amoeba* population?



10. Which part of the picture below has the least amount of chlorophyll?



- A. Palisade mesophyll cell
- B. Bundle sheat cell
- C. Spongy mesophyll cell
- D. Guard cell

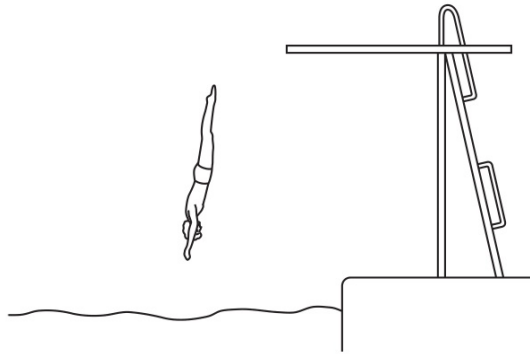
11. According to these statements

- (1) The value of gravitational acceleration in the liquid increases with depth.
- (2) The density of the liquid increases with depth.
- (3) The pressure in the liquid increases with depth.
- (4) The density of the body differs from that of liquid.

Which statement(s) is/are related to physical reasons for up thrust exerted by a fluid that opposes the weight of an immersed body in a liquid?

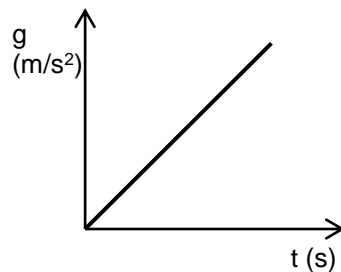
- A. (1) and (3)
- B. (2) and (4)
- C. (2)
- D. (4)

12. The figure illustrates a diving athlete.

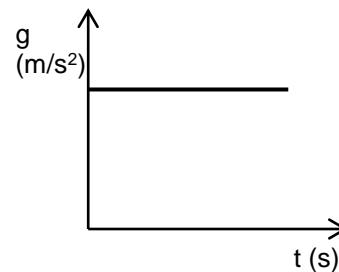


Which is the correct graph that show relation between gravitational acceleration and time?

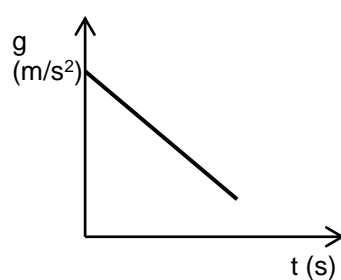
A.



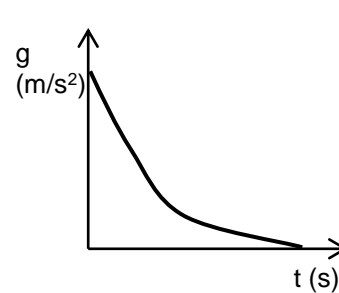
C.



B.



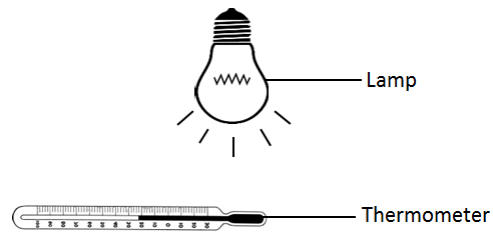
D.



13. A series of four wires with equal lengths but different cross-section areas of 1 mm^2 , 2 mm^2 , 3 mm^2 and 4 mm^2 is connected to a 25 Volt source. What is the potential difference across the 2 mm^2 wire?

- A. 2.50 Volt
- B. 5.00 Volt
- C. 7.50 Volt
- D. 10.0 Volt

14. The diagram below shows the position of a lamp and a thermometer.

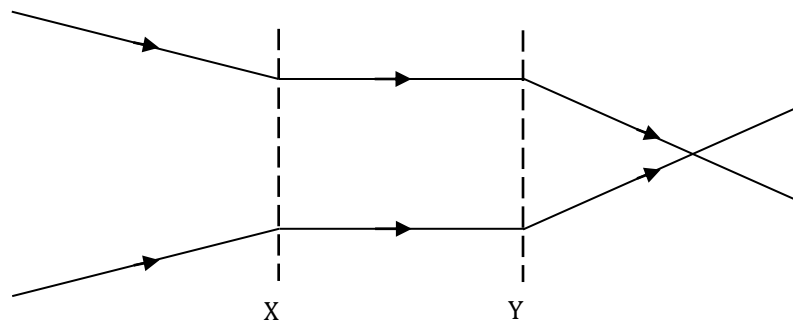


The processes explain heat energy transfer from the lamp to the thermometer are

| | Conduction | Convection | Radiation |
|----|------------|------------|-----------|
| A. | no | no | yes |
| B. | no | yes | yes |
| C. | yes | yes | no |
| D. | no | yes | no |

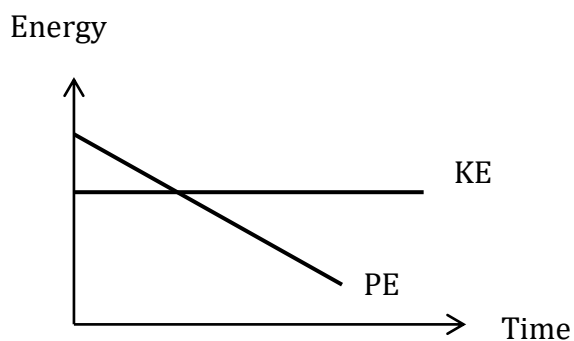
15. The diagram below shows two light rays passing through two lenses (X and Y)

What are X and Y respectively?



| | X | Y |
|----|--------------|--------------|
| A. | Concave lens | Concave lens |
| B. | Convex lens | Concave lens |
| C. | Concave lens | Convex lens |
| D. | Convex lens | Convex lens |

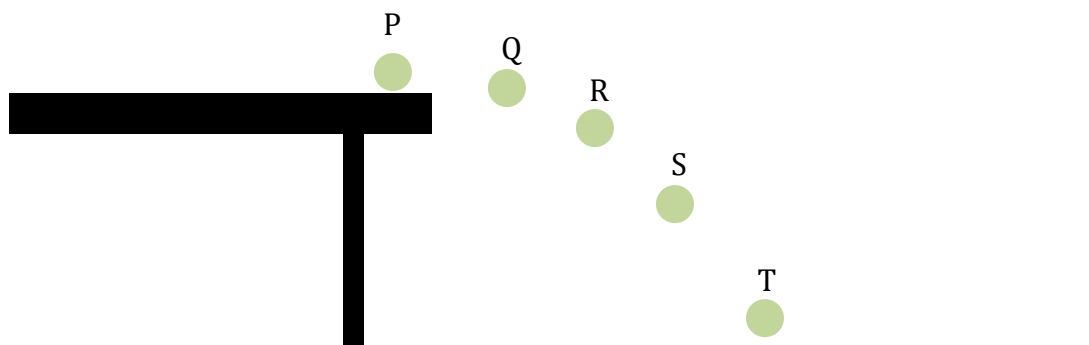
16. The graph below presents a motion of an object



The graph shows the variation with time of the gravitational potential energy (PE) and the kinetic energy (KE). Which of the following statements is the best conclusion according to the graph?

- A. An object is moving downward at constant acceleration
- B. An object is moving downward at constant speed
- C. An object is moving upward at constant acceleration
- D. An object is moving upward at constant speed

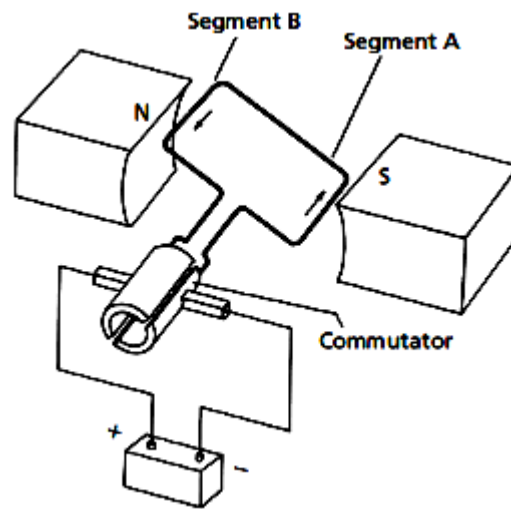
17. The figure below shows a ball sliding from the end of a table to the ground.



The net force act on the ball at point T (the air friction neglected) is...

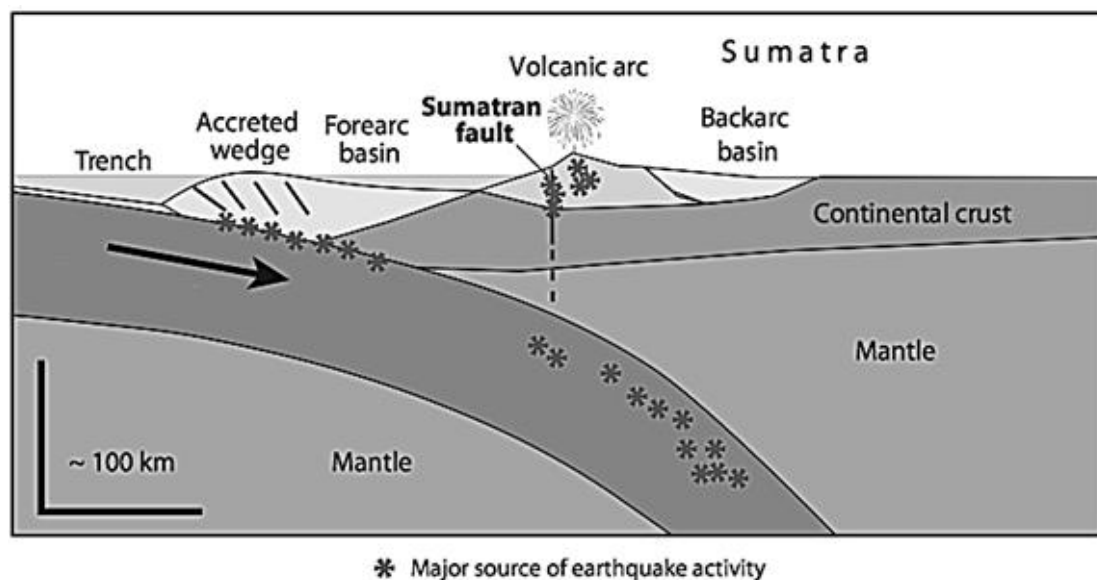
| | | | |
|----|--|----|--|
| A. | | C. | |
| B. | | D. | |

18. The following figure shows the process of inducing current and electromotive force by moving conductive wire across magnetic field lines.



According to the figure, the common device which produces electric power is called...

- A. AC Generator
B. DC Generator
C. AC Motor
D. DC Motor
19. The figure below shows a movement of tectonic plates at Sumatra Island



Tectonic plates that move away each other is called...

- A. Convergent
B. Divergent
C. Subduction
D. Obduction

20. Study these statements below

- (1) Moon is outside of the gravitational influence of the Earth.
- (2) Moon is in balance with the gravitational forces from the Sun and other planets.
- (3) The net force on the Moon is zero.
- (4) The gravitational force exerted by the Earth on the Moon provides a net force that causes the Moon's centripetal acceleration.

Which statement(s) can explain why the moon prefers in its orbit around the Earth rather than falling to the Earth?

- A. (1)
- B. (1) and (3)
- C. (2) and (4)
- D. (4)

Short Questions

1. **(3 points)** When the internal body temperature rises, what is the action taken by our body? (Put a check (✓) on the box below (a), (b), and (c) in the answer sheet)

| | | | | | |
|------------------|-----|------------------|-----|-------------|-----|
| Blood capillary | (a) | Urine Production | (b) | Sweat Gland | (c) |
| Vasoconstriction | | Increase | | Active | |
| Vasodilatation | | Decrease | | Not active | |

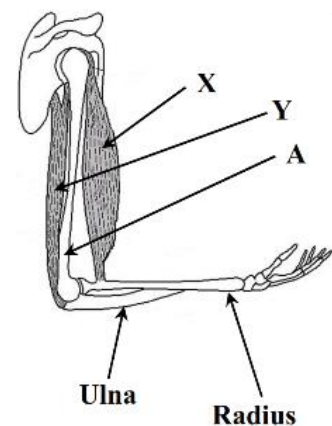
2. **(4 points)** The diagram shows the hinge joint at the elbow.

- (a). What is the name for bone A?
- (b). Where else in the body would you find a hinge joint?
- (c). Ligaments and tendons are found in a hinge joint.

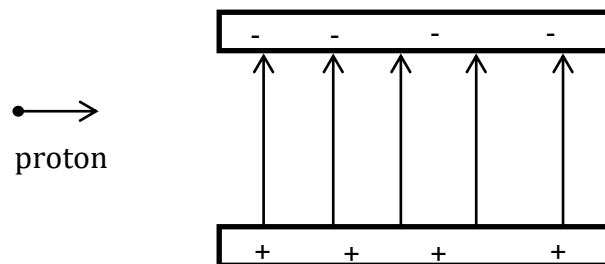
What is the function of a tendon?

- (d). Muscle X in the diagram has contracted.

What happens when muscle Y contracts?

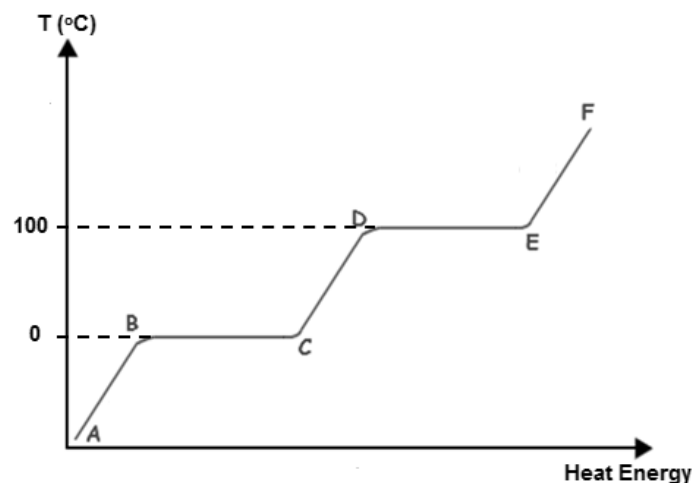


3. **(2 points)** A copper bar and an amount of water have equal mass. Both of them are heated with the same increasing temperature. If the heat absorption rate are the same, the heating time for the water is ____ (a) ____ than the copper bar. It occurs because the water has ____ (b) ____ specific heat.
4. **(2 points)** A proton, traveling horizontally at constant speed in a vacuum. According to the figure, a proton moving through charged plates.



The speed of proton in horizontal component when it pass through the electric field is ____ (a) ____ and the proton will accelerate to ____ (b) ____

5. The following diagram shows the heating curve of the materials.



- (a). **(4 points)** There are some phase changes:

- The process of phase change at B - C is called _____
- The process of phase change at C - B is called _____
- The process of phase change at D - E is called _____
- The process of phase change at E - D is called _____

- (b). **(1 point)** The substance is inside an opened container at room temperature ambient. Which greater heat energy is needed, in melting or freezing processes?