

Physical and Chemical Sciences
Energy

Additional FCAT Practice Questions

Directions: Select the best answer for each of the following questions

1. Flashlights are a very common household item.



Which of the following best represents the conversion energy that occurs in a battery-powered flashlight?

- A. Chemical energy is converted to light and thermal energy
- B. Chemical energy is converted into thermal energy
- C. Chemical energy is converted into electrical energy
- D. Chemical energy is converted in light and magnetic energy

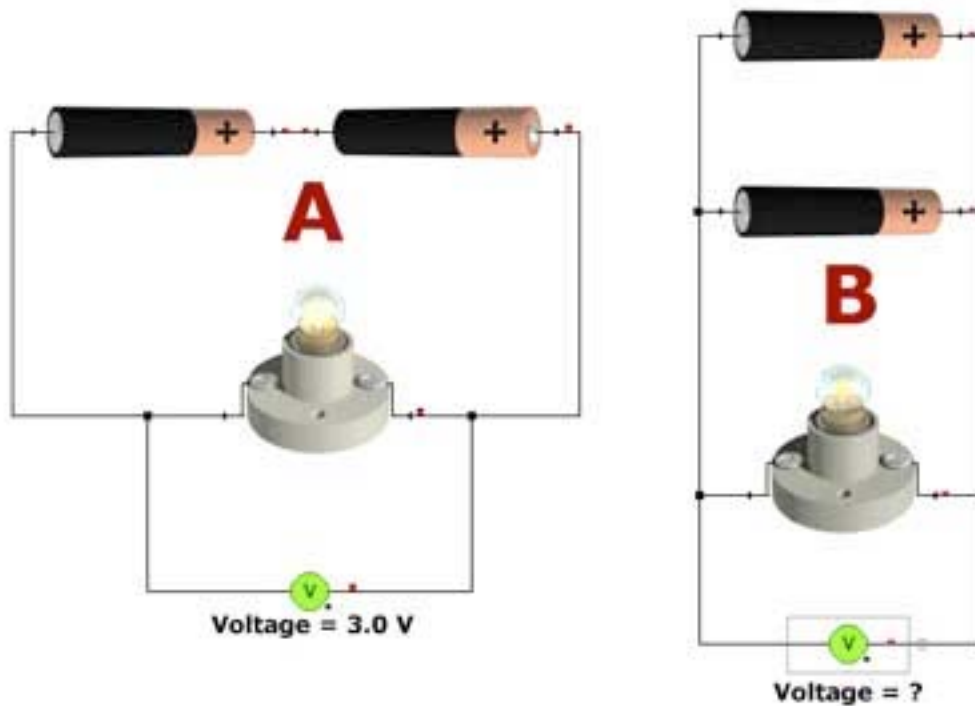
2. A cute kitten sleeps in the sun which streams in through a window.



What form of energy does the kitten absorb?

- A. Electromagnetic energy
- B. Light energy
- C. Thermal energy
- D. Chemical energy

3. Using 1.5-volt dry cells, Mario built a series circuit (A) and measured the voltage to be 3.0 V.



He then rearranged the items in a new circuit (B). What will the voltmeter read for circuit B?

- A. 0.75 V
 - B. 3.0 V
 - C. 6.0 V
 - D. 1.5 V
4. A red-hot stove element transfers heat to a pot on top of it. What is this transfer of energy an example of?
- A. Convection
 - B. Insulation
 - C. Radiation
 - D. Conduction

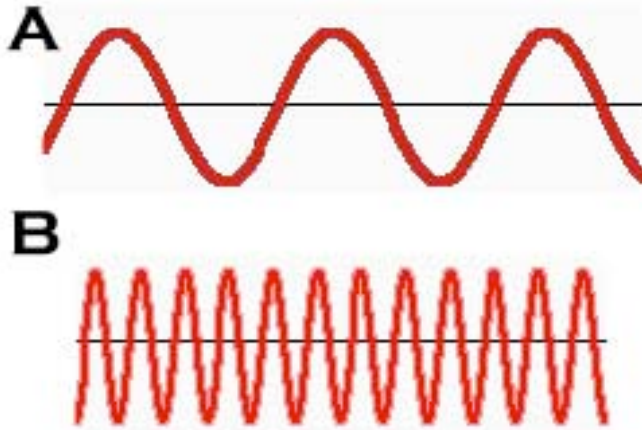
5. Amy and Cedric are cooking wieners over an open campfire. Amy is using a wooden stick; while Cedric is using a steel coat hanger he has bent into a long thin cooking wire. After a few minutes of cooking, Cedric feels the wire becoming uncomfortably hot. Amy's wooden stick remains cool to the touch. Which of the following best describes this situation?
- A. Steel is a better insulator than wood
 - B. Wood is a better conductor of heat than steel
 - C. Steel is a better conductor of heat than wood
 - D. Steel is better at convection of heat than wood
6. The following diagram represents the path of a light ray as it strikes two mirrors.



What are the properties of light demonstrated by the diagram?

- A. Light can be reflected, and it can be bent
- B. Light travels in straight lines, and can be bent
- C. Light is a form of energy that can be bent
- D. Light travels in straight lines, and can be reflected

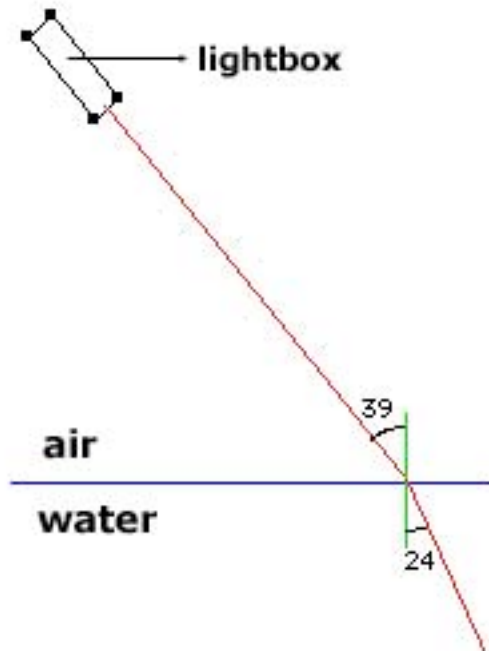
7. Using a computer program, Daruka generates two waveforms.



Based on a comparison of the two waveforms, which of the following is correct?

- A. Wave A has a lower frequency than wave B
- B. Wave B has a lower frequency than wave A
- C. Wave A and B have different frequencies, but the same wavelength
- D. Wave A and B have different wavelengths, but the same frequency

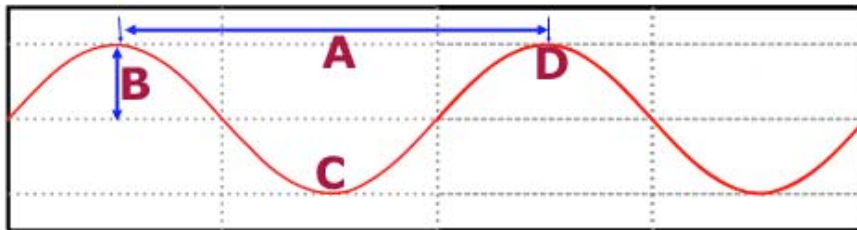
8. Ranjith sets up an experiment where he shoots a beam of light into water at an angle.



The numbers in the diagram represent angles measured from a perpendicular line from the surface at the point where the light strikes the water. Based on the result of the experiment, which of the following statements is correct?

- A. Due to the light bending when it strikes the water, this is an example of refraction
- B. Due to the light bending when it strikes the water, this is an example of reflection
- C. Due to the light bending when it strikes the water, this is an example of diffraction
- D. Due to the light bouncing off the water, this is an example of reflection

9. While wading in a stream, you reach down to pick up a pop can that is under the water, but you miss. What is the most likely reason for you missing the pop can?
- Light rays from the pop can bend as they leave the water
 - Light rays from the pop can reflect off the water surface
 - Light rays from the sun heading to the pop can reflect off the water surface
 - The pop can moves every time you reach for it
10. In the following diagram of a wave, labels A, B, C, D indicate important parts.



- Which of the following correctly identify the parts of a wave?
- A= amplitude, B= wavelength, C= trough, D= crest
 - A= wavelength, B= amplitude, C= crest, D= trough
 - A= wavelength, B= amplitude, C= trough, D= crest
 - A= amplitude, B= wavelength, C= crest, D= trough
11. Appliances in the past were often built without regard to energy consumption. For example, today's refrigerators are 300% more efficient than those built in 1970. Considering this increase in appliance efficiency, which of the following statements is true?
- Older refrigerators could not keep food cold.
 - Modern refrigerators waste more electrical energy than older refrigerators
 - Both modern and older refrigerators used the same amount of energy to keep food cold
 - Older refrigerators wasted more electrical energy than modern refrigerators

12. Electricity is transmitted great distances from where it is generated to where it is used. Unfortunately, the transmission is not perfect; by the time the electric energy reaches the end, there is less of it than where it started. Which of the following is the most reasonable explanation for the lost energy?
- A. As the electricity flows, some of the energy is converted to light energy
 - B. As the electricity flows, some of the energy is converted to heat energy (making the wire warm)
 - C. As the electricity flows, some of the energy is lost to the ground
 - D. As the electricity flows, some of the energy is converted to chemical energy
13. There are many types of light bulbs, but the two most common are incandescent and fluorescent.



incandescent



fluorescent

Neither bulb type is perfect; they both create waste energy during operation. However, fluorescent bulbs are about four times more efficient than incandescent bulbs. Considering this difference in efficiency, which of the following statements is true?

- A. For every unit of electric energy, a incandescent bulb turns more energy into light than an fluorescent bulb
- B. For every unit of electric energy, a fluorescent bulb turns more energy into light than an incandescent bulb
- C. For every unit of electric energy, a fluorescent bulb turns more energy into heat than an incandescent bulb
- D. An incandescent bulb wastes less energy than a fluorescent bulb

14. Hybrid vehicles have an electric motor as well as a regular engine.



When a normal non-hybrid brakes, it is done by friction, with pads pressing against the wheels. In a hybrid vehicle, pressing the brakes causes energy of motion to go into the electric motor, which recharges the car batteries. Considering these two different approaches to braking, which of the following statements is most reasonable?

- A. A non-hybrid vehicle captures energy of motion while braking that would otherwise be wasted in hybrid vehicle
 - B. A hybrid vehicle captures energy of motion while braking that would otherwise be wasted in non-hybrid vehicle
 - C. Hybrid vehicles and non-hybrid vehicles use braking energy in the same way
 - D. Non-hybrid vehicles are more efficient than hybrid vehicles.
15. Before riding a bicycle it is important to check if the brakes are working properly. Bicycle brakes work by forcing a rubber pad against the rim of the bicycle so that it rubs, slowing the wheel down. What is the energy conversion that takes place when the brakes are used on a fast-moving bicycle?
- A. Potential energy is converted to kinetic energy
 - B. Thermal energy is converted to kinetic energy
 - C. Kinetic energy is converted to thermal energy
 - D. Kinetic energy is converted to potential energy

Answers

1. A
2. C
3. D
4. D
5. C
6. D
7. A
8. A
9. A
10. C
11. D
12. B
13. B
14. B
15. C