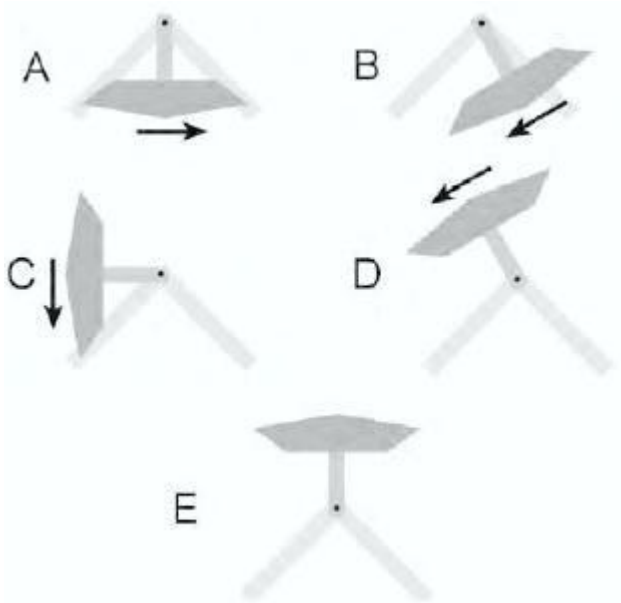
SAT Physics Practice Test 21
Part A



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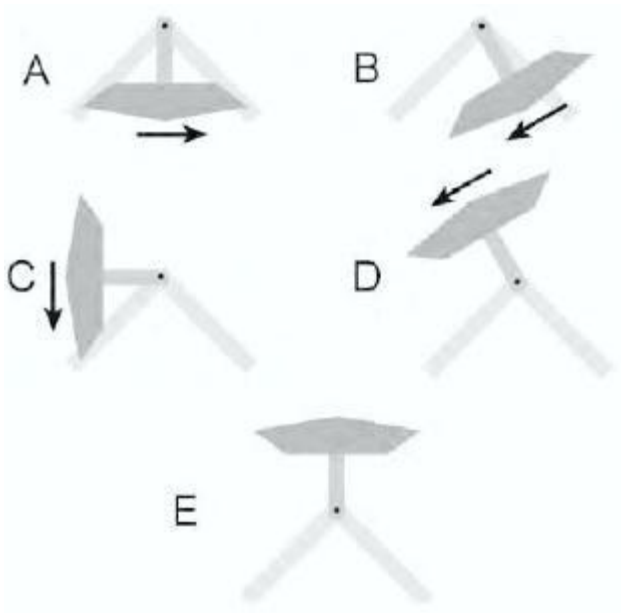
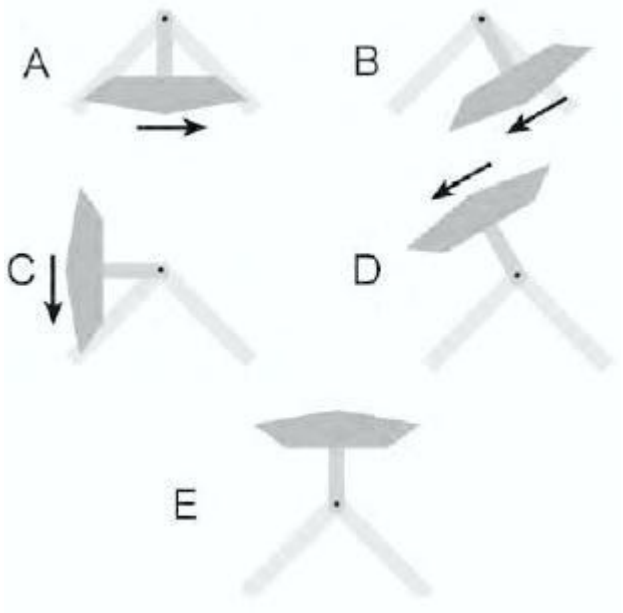
1.An amusement park ride called DaVinci's cradle swings the riders around a complete circle during the course of the ride.
Where on the ride is the velocity the largest value?

A. Point A
B. Point B
C. Point C
D. Point D
E. Point E

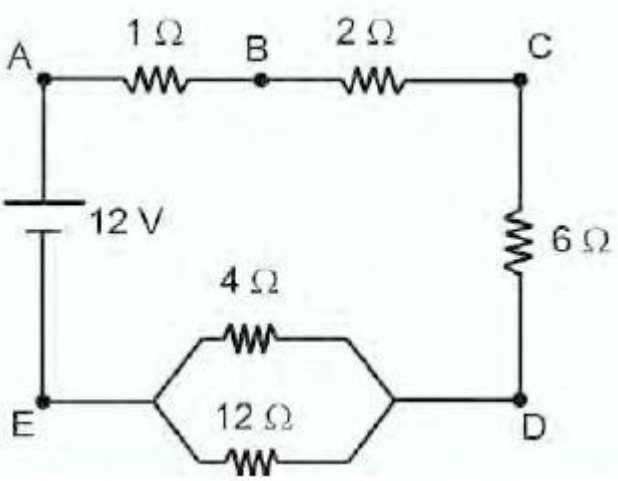


2.An amusement park ride called DaVinci's cradle swings the riders around a complete circle during the course of the ride.
Where on the ride is the potential energy the largest value?
A. Point A
B. Point B
C. Point C
D. Point D
E. Point E

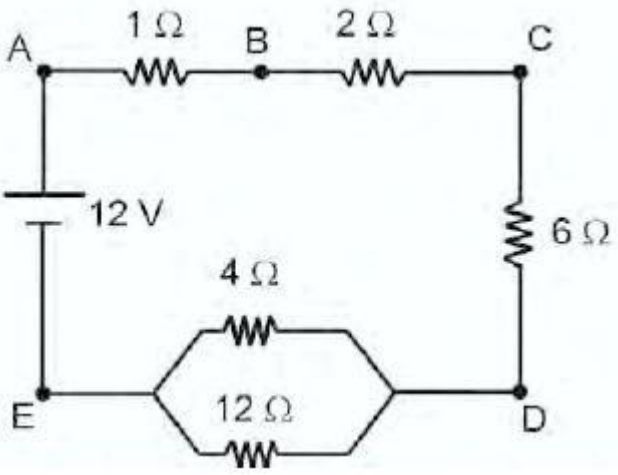


3.An amusement park ride called DaVinci's cradle swings the riders around a complete circle during the course of the ride.
Where on the ride are the PE and the KE equal to each other?

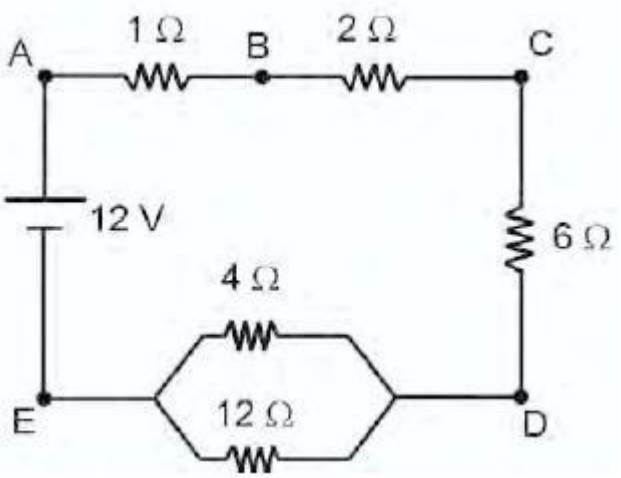
A. Point A
B. Point B
C. Point C
D. Point D
E. Point E



4.The electrical circuit shown has 1 ampere of current flowing in it. Answer the questions about the parts of the circuit listed between the points below by choosing the letter that correctly represents the quantity in question.
Between which, two points is the voltage change the largest?
A. Between points A→B
B. Between points B→C
C. Between points C→D
D. Between points D→E
E. Between points E→A



5.The electrical circuit shown has 1 ampere of current flowing in it. Answer the questions about the parts of the circuit listed between the points below by choosing the letter that correctly represents the quantity in question.
Between which two points is the voltage change the smallest?
A. Between points A→B
B. Between points B→C
C. Between points C→D
D. Between points D→E
E. Between points E→A



6.
The electrical circuit shown has 1 ampere of current flowing in it. Answer the questions about the parts of the circuit listed between the points below by choosing the letter that correctly represents the quantity in question.
Between which two points is the resistance value the largest?
A. Between points A→B
B. Between points B→C
C. Between points C→D
D. Between points D→E
E. Between points E→A

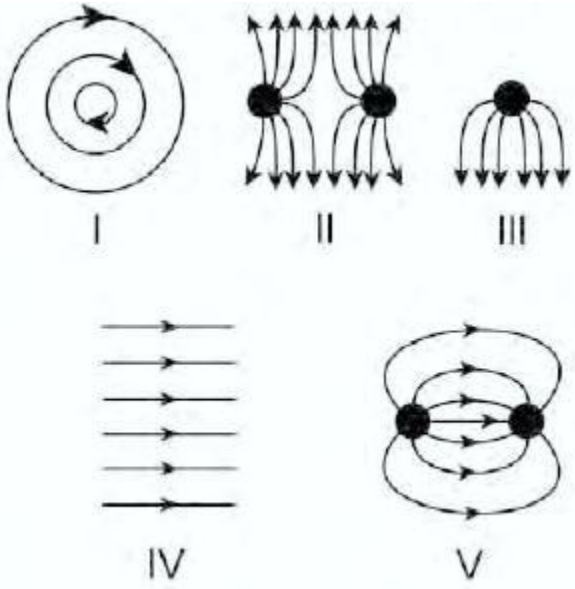
7. An object is placed in front of an optical device, and an image is obtained. Select the device that would produce the types of images described below.
The image produced is erect, virtual, and reversed from left to right.
A. Concave mirror
B. Convex mirror
C. Concave lens
D. Convex lens
E. Flat mirror

8. An object is placed in front of an optical device, and an image is obtained. Select the device that would produce the types of images described below.
The image produced is inverted, real, and on the same side of the device.

A. Concave mirror
B. Convex mirror
C. Concave lens
D. Convex lens
E. Flat mirror

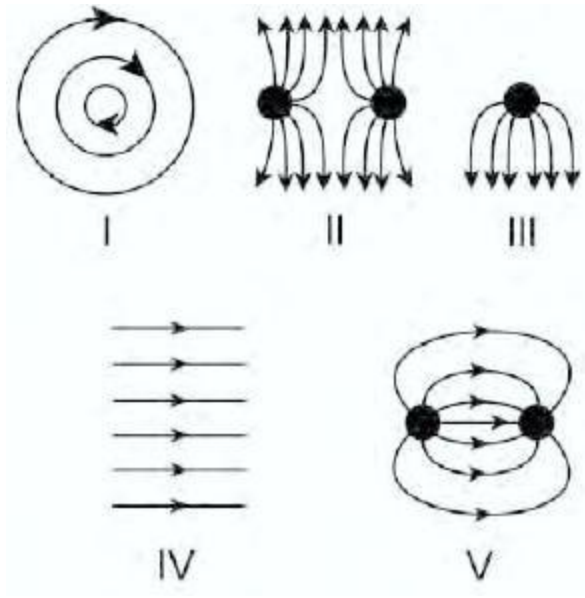
9. An object is placed in front of an optical device, and an image is obtained. Select the device that would produce the types of images described below.
The image produced is inverted, real, and on the opposite side of the device.
A. Concave mirror
B. Convex mirror
C. Concave lens
D. Convex lens
E. Flat mirror

10. This question relates to the electric fields shown in the diagrams below, which represent two charged objects near each other in space.



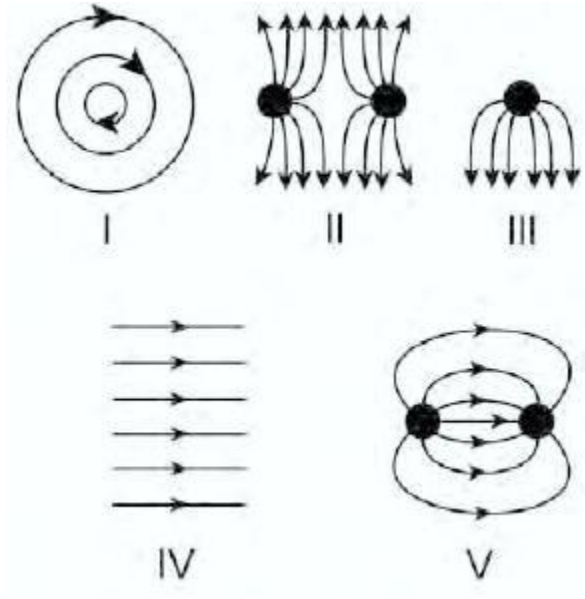
Which drawing represents two like point charges?
A. Drawing I
B. Drawing II
C. Drawing III
D. Drawing IV
E. Drawing V

11. This question relates to the electric fields shown in the diagrams below, which represent two charged objects near each other in space.



Which drawing represents the field from parallel plates?
A. Drawing I
B. Drawing II
C. Drawing III
D. Drawing IV
E. Drawing V

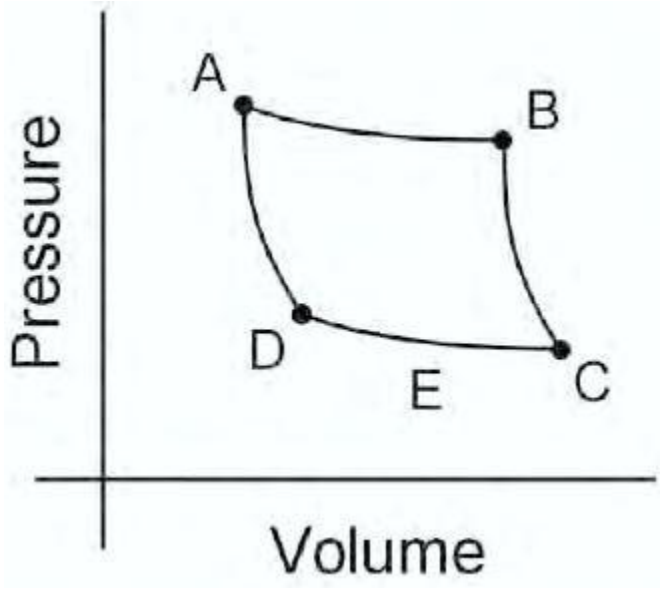
12. This question relates to the electric fields shown in the diagrams below, which represent two charged objects near each other in space.



Which drawing represents two, unlike point charges?
A. Drawing I
B. Drawing II
C. Drawing III

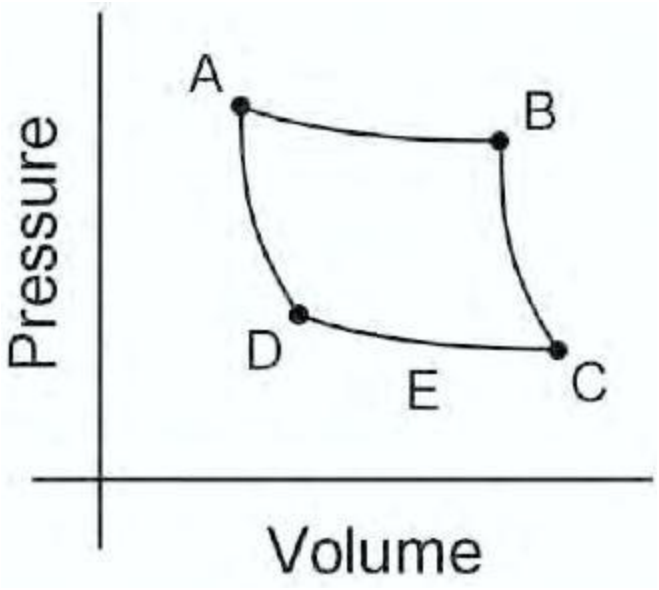
D. Drawing IV
E. Drawing V

13. This question relates to the P-V diagram of the heat cycle below. For the gas shown in the diagram, 70J of energy is added to the system.



Where is the heat added to the system?
A. A→B
B. B→C
C. C→D
D. D→A
E. A→B→C→D→A

14. This question relates to the P-V diagram of the heat cycle below. For the gas shown in the diagram, 70J of energy is added to the system.



Where is the exhaust heat released from the system?
A. A→B
B. B→C
C. C→D
D. D→A
E. A→B→C→D→A

15. Protons are found in the nucleus of the atom. The nuclear protons with the greatest mass are located
A. in the hydrogen atom.
B. in the carbon atom.
C. in the iron atom.
D. in the radon atom.
E. in the uranium atom.

Part 2

1. Four resistors are hooked together in parallel. The resistors have values of 20, 40, 60, and 80 respectively. What is the total resistance of the resistors?
A. 4.4
B. 9.6
C. 14.8
D. 20
E. 25.2

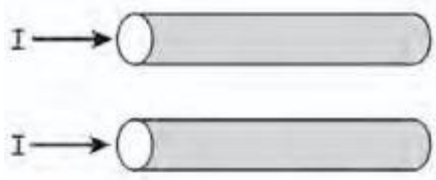
2. An Olympic weight lifter lifts a weight bar weighing 2000N straight up to a height of 2.25 m in a time of .65 seconds. The weight lifter stands holding the weight at that height for the next 4 seconds before dropping the weights to the floor.

How much work did the weight lifter do while holding the weights overhead?
A. 1300 Joules
B. 3077 Joules
C. 4500 Joules
D. 8000 Joules
E. No work was done

3. An Olympic weight lifter lifts a weight bar weighing 2000N straight up to a height of 2.25 m in a time of .65 seconds. The weight lifter stands holding the weight at that height for the next 4 seconds before dropping the weights to the floor.
How much power did the weight lifter use to lift the weights overhead?
A. 2925 watts
B. 3077 watts
C. 4500 watts
D. 6923 watts
E. 9100 watts

4. A light ray strikes a photovoltaic metal as shown above. Which of the following statements is correct if a voltage is introduced into the metal by the light ray?
I. The light ray is blue light.
II. The beam is below the threshold.
III. The beam does not contain any photons.
A. I only
B. II only
C. I and III only
D. II and III only
E. I, II, and III

5. A rescue plane flying at 162 km/hr drops a survival package to a group of stranded skiers from a height of 70 m. After dropping the package the pilot of the plane continues to fly in a straight line. When the package strikes the ground it is
A. 85 m behind the plane.
B. 170 m behind the plane.
C. 255 m behind the plane.
D. 462 m behind the plane.
E. directly beneath the plane.



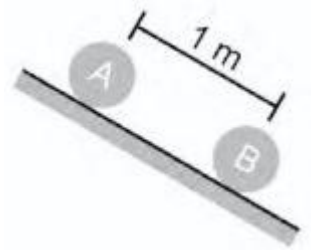
6. In the diagram above, two wires are aligned side by side. They are both hooked into different circuits in which the current is switched on to allow the current to flow in each circuit. Which of the following statements is correct?
A. The two currents destructively interfere with each other.
B. The two currents constructively interfere with each other.
C. The two wires attract and move closer.
D. The two wires repel and move away.
E. The two wires remain still.

7. A species of a hummingbird beats its wings 3,300 times per minute. What frequency of sound will a nearby person hear when the hummingbird flies by?
A. .003 Hz
B. .018 Hz
C. 6 Hz
D. 55 Hz
E. 3300 Hz

8. A student uses a magnetic compass to perform a laboratory experiment in the Northern Hemisphere. She then carries the same magnetic compass with her to the Southern Hemisphere, taking care not to damage the compass in any way. When she reaches her destination at the equivalent latitude and longitude in the Southern Hemisphere, she prepares to perform the same laboratory experiment. The student looks at the compass before performing the experiment to see if the compass needle has changed. How has the compass changed?
A. The compass needle points 90°to the left of the expected direction.
B. The compass needle points 90°to the right of the expected direction.
C. The compass needle slowly rotates in a counter-clockwise direction.
D. The compass needle slowly rotates in a clockwise direction.
E. There has been no change in the compass.

9. An ideal gas is placed in a 4L container at a temperature of 300K and a pressure of 6 atmospheres. The pressure is held constant while the volume of the gas is halved. What is the new temperature of the gas?
A. 1200K
B. 600K
C. 300K
D. 150K
E. 75K

10. A photovoltaic metal absorbs a photon of yellow light and immediately emits an ultraviolet photon. This is called
A. fluorescence.
B. in fluorescence.
C. phosphorescence.
D. photoluminescence.
E. This is not possible.



11. Two spheres are at rest on an inclined ramp as shown above. Sphere A has a mass ten times larger than sphere B. Both spheres are released at the same time and roll down the ramp. Which statement best describes the situation by the time sphere B reaches the bottom of the ramp?
A. The velocity of sphere A equals the velocity of sphere B.
B. The kinetic energy of sphere A equals the kinetic energy of sphere B.
C. The potential energy of sphere A equals the potential energy of sphere B.
D. Sphere A will catch up to sphere B.
E. Sphere B accelerates away from sphere A.

12. The frequency of a wave is 4 cycles per second, and its speed is .08 meters per second. What is the period of one of the waves?
A. .25 seconds
B. .55 seconds
C. 3.125 seconds
D. .02 seconds
E. 12.55 seconds

13. The frequency of a wave is 4 cycles per second, and its speed is .08 meters per second. What is the wavelength of one of the waves?
A. .25 seconds
B. .55 seconds
C. 3.125 seconds
D. .02 seconds
E. 12.55 seconds

14. An electric circuit is composed of a pair of parallel 30 ohm resistors in series with a 9-ohm resistor. The current through the 9-ohm resistor is .25 A. What is the voltage applied to the circuit?

A. 1.5 V
B. 3 V
C. 6 V
D. 12 V
E. 24 V

15. Which of the following best describes the condition of an enclosed gas during an adiabatic compression?
A. The internal energy of the gas increases.
B. Work is done by the gas.
C. Work is done on the gas.
D. The gas remains at a constant temperature.
E. The temperature of the gas decreases