SAT Physics Practice Test 26
Part D

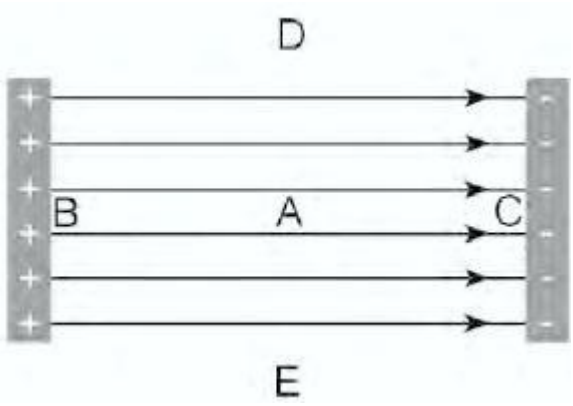
1. A clothesline is strung between two posts, and wet clothing weighing 200 N is hung on the line, which sags under the weight of the clothes. If one end of the line is pulled to straighten the line, which of the following would be true?
I. The tension in the rope undergoes a large increase.
II. The tension in the rope undergoes a large decrease.
III. The weight in the rope undergoes a large increase.
A. I only
B. II only
C. I and III only
D. II and III only
E. I, II, and III

2. The current through a 20Ω resistor connected to a 12V battery is
A. .3 amperes.
B. .6 amperes.
C. .9 amperes.
D. 1.6 amperes.
E. 1.9 amperes.

3. When U-235 is fissioned in a nuclear reactor, the nuclear reaction is maintained by
A. heat produced in the reactor.
B. the moderator rods.
C. radioactive decay products.
D. vibrations induced in the U-235.
E. neutrons produced in the reaction.

4. The force a magnetic field exerts on an electron is largest when the path of the electron is oriented
A. in the opposite direction from the magnetic field's direction.
B. in the same direction as the magnetic field's direction.
C. up through the magnetic field at a 45° angle.
D. down through the magnetic field at a 45° angle.
E. at a right angle to the magnetic field.

5. When a light ray strikes a perfectly reflective mirror at an angle, which of the following happens?
A. The frequency of the light ray changes.
B. The wavelength of the light ray changes.
C. The velocity of the light ray changes.
D. The period of the light ray changes.
E. The direction of motion of the light ray changes.



6. An electron, a proton, and a neutron are located at point (A) above in an electric field. A short period of time passes. At which position as indicated by the letter on the diagram will the proton be located?
A. Point A
B. Point B
C. Point C
D. Point D
E. Point E

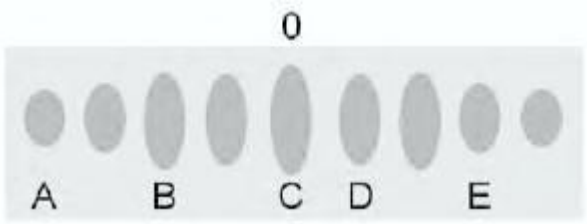
7. If the pressure acting on an ideal gas that is kept at constant temperature is multiplied by four, its volume
A. triples.
B. reduces to 1/3.
C. increases by four.
D. reduces to 1/4.
E. There is not enough information to tell.

8. The electron-volt (eV) is a unit of
A. power.
B. voltage.
C. current.
D. potential.
E. energy.

9. A pile driver is raised to a height of 25 m in 10 seconds. It is released and allowed to fall onto a piling. Although guided by a set of rails, the pile driver essentially is in free-fall after its release. Which of the following is/ are correct?
I. The power input equals the power output.
II. The PE in equals the KE out.
III. The KE in equals the workout.
A. I only
B. II only

C. I and III only
D. II and III only
E. I, II, and III only

10. A dog walks 120 m due east, then turns and runs 60 m west. An interesting smell attracts the dog, and it trots 40 m due north. At this point, the dog is 85 m northeast of his home. The dog hears his master call him and he runs directly home. Which part of the trip is the largest vector?
A. The eastward leg
B. The westward leg
C. The northward leg
D. The distance from home
E. The distance to home

11. 

Which letter above represents a 3λ difference in path length?
A. Position A
B. Position B
C. Position C
D. Position D
E. Position E

12. A 1,000 kg car rolls without friction down a hill that is 20 m long and inclined at 15°C from the horizontal. What is the velocity of the car at the bottom of the hill?
A. 2 m/s
B. 5 m/s
C. 10 m/s
D. 20 m/s
E. 30 m/s

13. Sound waves cannot travel in
A. air.
B. metal.
C. vacuum.
D. water.
E. wood.

14. Consider a light wave that passes from air into a very thick clear glass block that has its opposite internal side mirrored (facing into the glass). The light ray passes into the glass block

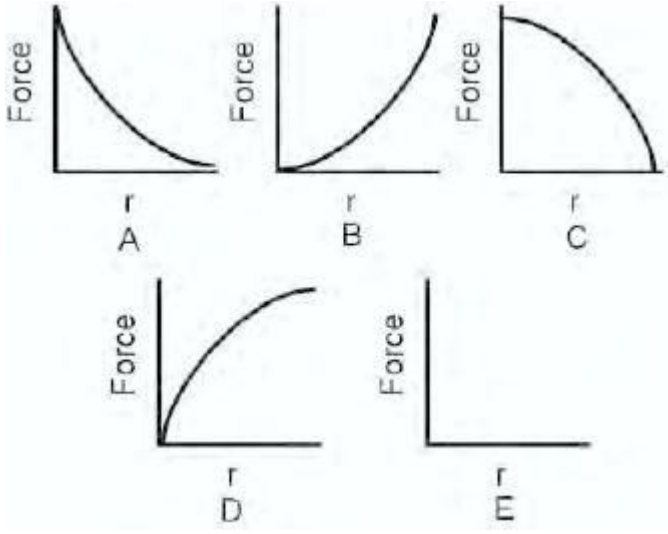
at an angle greater than 0° and less than 90°, strikes the mirrored surface, and reflects back through the glass into the air.
What happens while the light ray is in the glass block but before it strikes the mirrored surface?
A. The frequency of the waves increases.
B. The frequency of the waves decreases.
C. The wavelength of the waves decreases.
D. The velocity of the waves decreases.
E. The period of the waves increases.

15. Consider a light wave that passes from air into a very thick clear glass block that has its opposite internal side mirrored (facing into the glass). The light ray passes into the glass block at an angle greater than 0° and less than 90°, strikes the mirrored surface, and reflects back through the glass into the air.
What happens when the light ray leaves the glass block after it has struck the mirrored surface?
A. The waves reflect back on the glass.
B. The waves increase velocity.
C. The waves leave the glass at the same angle at which they entered the glass.
D. The angle of refraction is greater than the angle of incidence.
E. The angle of reflection from the mirror is equal to the incident angle at which the light struck the glass block.

Part E

1. The most notable difference between a radio wave and a light wave is
A. speed.
B. refractive index.
C. reflectivity.
D. amplitude.
E. frequency.

2.



Which of the graphs above shows two electrons as they separate from one another?
A. Graph A
B. Graph B
C. Graph C
D. Graph D
E. Graph E

3. During a pool game the cue ball is shot at the red ball. When the cue ball strikes the red ball, the cue ball stops dead, and the red ball moves away at the same velocity the cue ball had before the collision. The type of collision represented in this example is
A. an elastic collision.
B. a perfectly inelastic collision.
C. an inelastic collision.
D. all of the above.
E. none of the above.

4. The images formed by convex mirrors
A. are always real.
B. is always virtual.
C. is only real when the object is placed outside the radius of curvature.
D. are only virtual when the object is placed inside the focal point.
E. None of the above describes the images formed by convex mirrors.

5. Two different light bulbs are in a DC circuit powered by an 18 V battery as its power source. The two bulbs are rated at 4.5 watts (B_1) and 6.75 watts (B_2) each. What are the resistances of the two light bulbs (B_1) and (B_2)?
A. B_1 is 48 Ω, and B_2 is 72 Ω.
B. B_1 is 72 Ω, and B_2 is 48 Ω.
C. B_1 is 2.67 Ω, and B_2 is 4 Ω.
D. B_1 is 4 Ω, and B_2 is 2.67 Ω.
E. B_1 is 20.25 Ω, and B_2 is 45.56 Ω.

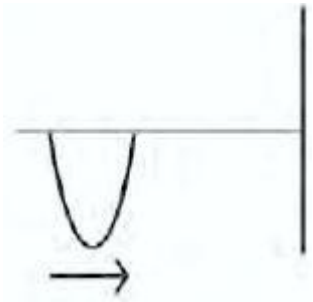
6. Scientists can determine whether a star is approaching the earth by looking at its
A. redshift.
B. blue shift.
C. rate of shimmer.
D. brightness.
E. absolute magnitude.
7. The volt is a measure of electrical potential and may be defined as
A. opposition to the electrical motion.
B. number of particles in motion.
C. work per unit charge.
D. field strength per unit of force.
E. electrostatic discharge.

8. A laboratory centrifuge starts from rest and reaches a rotational speed of 8,000 radians/sec in a time of 25 seconds. What is the angular acceleration of the centrifuge?
A. 160 radians/sec^2
B. 320 radians/sec^2
C. 640 radians/sec^2
D. 10,000 radians/sec^2
E. 20,000 radians/sec^2

9. An object at rest is placed into free fall at a height of 20 m. What is the velocity of the object when the PE equals the KE?
A. 8 m/s
B. 11 m/s
C. 14 m/s
D. 17 m/s
E. Velocity cannot be determined.

10. A battery and a variable resistor are in series with a small fan. A switch is closed, and the fan runs. When the variable resistor is moved slightly to the left, the fan slows down a little. When the variable resistor is moved slightly to the right, the fan speeds up a little. The following question is about the operation of the circuit described. If the variable resistor in the circuit is set all the way to the right, what happens in the circuit?
I. The fan runs faster.
II. The voltage decreases.
III. The current increases.
A. I only
B. II only
C. I and III only
D. II and III only
E. I, II, and III

11.



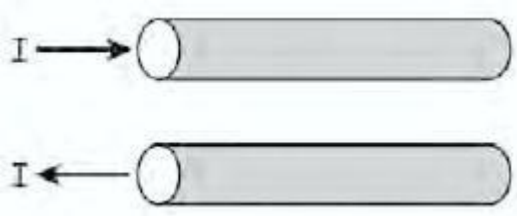
A pulse on a string moves toward and strikes a fixed end as shown. The pulse is
A. reflected and transmitted.
B. reflected and refracted.
C. reflected and reduced.

D. reflected and magnified.
E. reflected and inverted.

12. A thrown baseball hits and breaks a glass window and ends up inside the house. Which of the following is correct about the ball?
A. The force the ball exerted on the window was larger than the force the window exerted on the ball.
B. The force the ball exerted on the window was smaller than the force the window exerted on the ball.
C. The force the ball exerted on the window was the same as the force the window exerted on the ball.
D. Since the ball broke the window, it didn't lose any momentum.
E. The kinetic energy the ball had before it broke the window equaled the kinetic energy the ball had after it broke the window.

13. When a voltage source that is inducing a voltage into a large number of coils is disconnected, and a switch that is in series with the coils of wire is also opened, a spark is observed to jump across the switch terminals as the switch begins to open up. What is the cause of this spark?
A. Free electrons from the voltage source
B. Free electrons from the coils of wire
C. Collapse of the magnetic field in the coils of wire
D. Secondary electron flow from the source
E. Stored voltage in the coils of wire

14. Electrical energy is changed into mechanical energy in a device called a/an
A. electromagnet.
B. generator.
C. magnetron.
D. motor.
E. transformer.

15. 

Two wires are aligned side by side as shown above. They are both hooked into different circuits in which the current is off. A switch is closed, allowing current to flow into each circuit. Which of the following statements is correct?
A. The two currents destructively interfere with one another.
B. The two currents constructively interfere with one another.

C. The two wires attract and move closer.
D. The two wires repel and move away.
E. The two wires remain still.