SAT Physics Practice - Paper 44

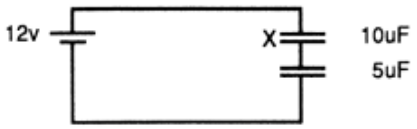
25. The lines of force near two charges equal in magnitude but opposite in sign are

(A) closer together where the electric field is weaker
(B) directed from the positive charge to the negative charge
(C) directed from the negative charge to the positive charge
(D) directed away from both the positive and negative charges
(E) farther apart where the electric field is stronger

26. The resistance of a uniform conductor is measured to be R. If the length of the conductor is halved and the cross-sectional area is doubled, what will be its new resistance?

(A) $\frac{1}{8}$R
(B) $\frac{1}{4}$R
(C) R
(D) 4R
(E) 8R

29. For the circuit illustrated below, what is the potential difference across the component labeled X?



(A) 0.8 volt
(B) 1.2 volts
(C) 4.0 volts
(D) 8.0 volts
(E) 12.0 volts

30. Liquid flows through a pipe at a rate of $2m^3/s$. The cross-sectional area of the pipe is $1m^2$. Assuming laminar flow occurs, what is the approximate rate of flow if the pipe diameter is quadrupled?

(A) 0.1 m^3/s
(B) 0.5 m^3/s
(C) 2 m^3/s
(D) 8 m^3/s

27. A sample of one isotope of carbon, ^{14}C, is being studied. After a period of 28,000 years, it is determined that only $\frac{1}{32}$ of the sample of ^{14}C remains. What is the approximate half-life of ^{14}C?

(A) 875 years
(B) 4200 years
(C) 5600 years
(D) 7000 years
(E) 14000 years

28. If a force of 10.0N is exerted over a 4.0 m^2 area, what is the pressure over this area?

(A) 0.4 Pa
(B) 2.5 Pa
(C) 4.0 Pa
(D) 5.0 Pa
(E) 40.0 Pa

Questions 32–33 A 10kg brick is carried from ground level to the top of a 100m building. A person carrying the brick must walk 150m up a staircase to reach the top of the building. Each step is 0.2m tall. The brick is then dropped from the top of the building. Assume frictional forces are negligible.

32. How much work is done by lifting the object to the top of the building?

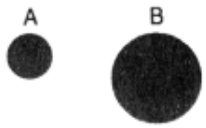
(A) 1000 J
(B) 1500 J
(C) 7350 J
(D) 9800 J
(E) 14700 J

33. What is the approximate kinetic energy of the object as it reaches ground level?

(A) 750 J
(B) 1500 J
(C) 4900 J
(D) 7350 J
(E) 9800 J

(E) 32 m^3/s

31. The gravitational force between two moving spherical objects, labeled A and B, is dependent on each of the following EXCEPT



(A) mass of object A
(B) distance separating objects
(C) mass of object B
(D) velocity of objects
(E) gravitational constant

36. The first law of thermodynamics encompasses each of the following ideas EXCEPT:

(A) conservation of energy
(B) energy cannot be created or destroyed
(C) energy may be converted into different forms
(D) likelihood of a process occurring
(E) change in internal energy of a system equals the difference between the heat absorbed and the work done by the system

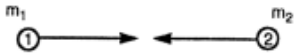
37. Which of the following always describe the image produced by a diverging lens?

I. Virtual
II. Erect
III. Smaller than object

(A) I only
(B) III only
(C) I and II only
(D) II and III only
(E) I, II, and III

34. A light illuminates a metal surface causing photoelectrons to be emitted. Which of the following most specifically accounts for the energies of the emitted electrons?

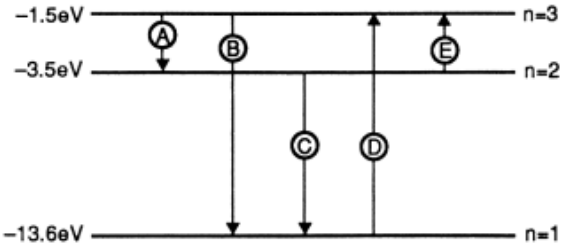
(A) Velocity of incident light
(B) Velocity of emitted electrons
(C) Size of area illuminated
(D) Frequency of incident light
(E) Mass of emitted electrons



35. Two balls are rolled along a frictionless surface, as illustrated above. The balls have the same mass and travel at identical speeds. If the balls meet in a completely elastic collision, each of the following conditions occurs EXCEPT:

(A) kinetic energy is conserved
(B) the mass of the system remains constant
(C) the balls will possess different magnitudes of acceleration
(D) each ball will possess the same momentum as before the collision
(E) each ball will possess the same momentum as after the collision

38. The chart below illustrates an energy level diagram for an atom. The labeled arrows depict various transitions between energy states. Which arrow represents the transition that will emit a photon of highest frequency?



(A) A
(B) B
(C) C
(D) D
(E) E

25. B 26. B 27. C 28. B 29. C 30. C 31. D 32. D 33. E 34. D 35. C