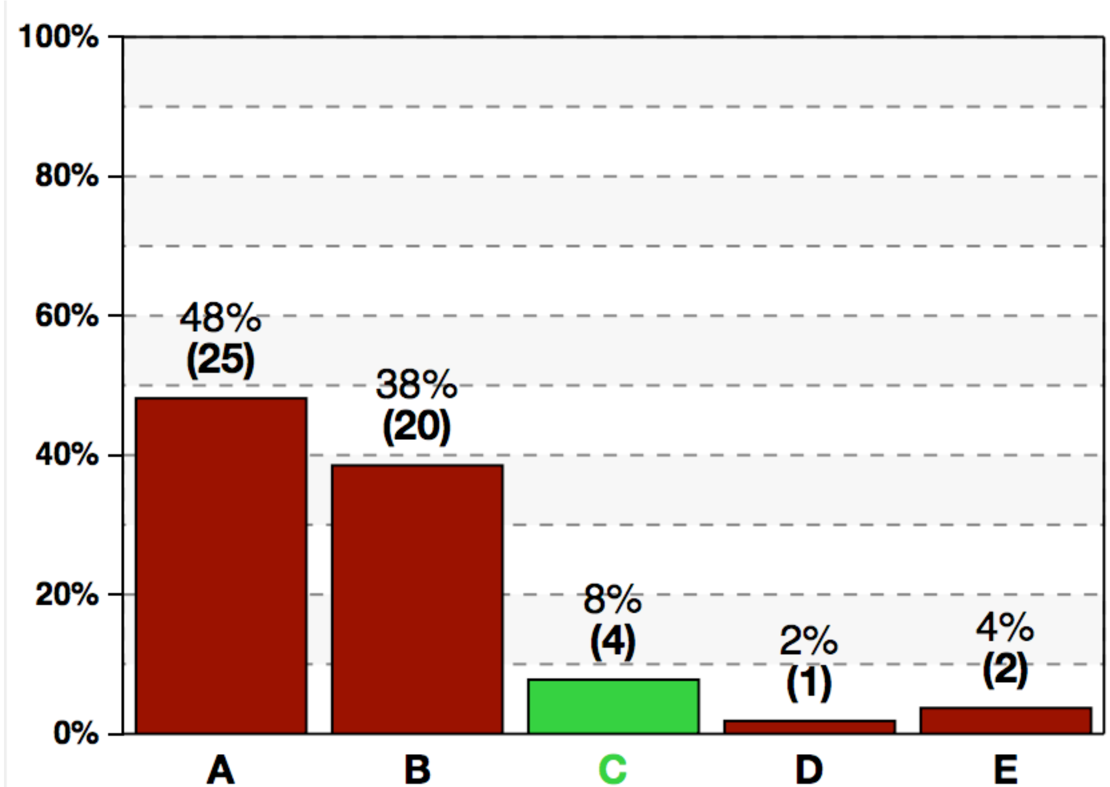
The momentum of a particle of mass m is p=mc. Its speed is

(a) c
(b) 0.99c
(c) 0.7c
(d) 0.4c
(e) 0.1c



The angular momentum of an electron in a hydrogen-like atom is $4\hbar$ according to the Bohr model. Its momentum could be:

(a) $8\,\hbar/a_0$

(b) $2\,\hbar/a_0$

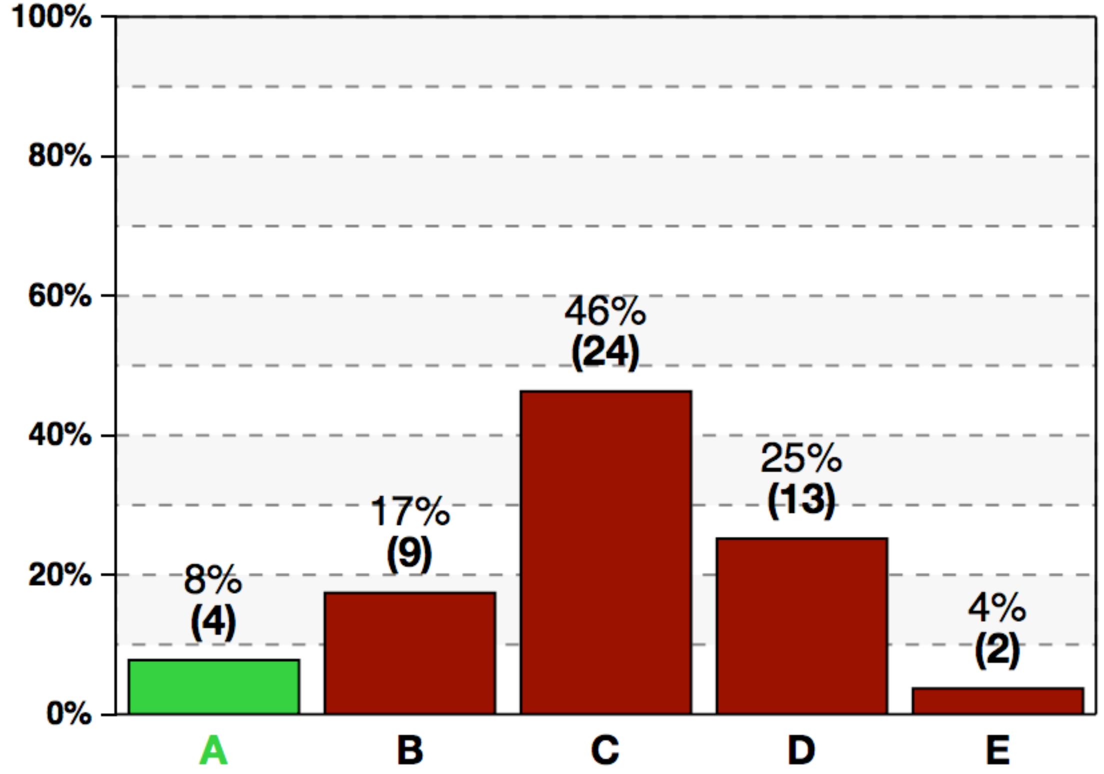
(c) $\hbar/(2a_0)$

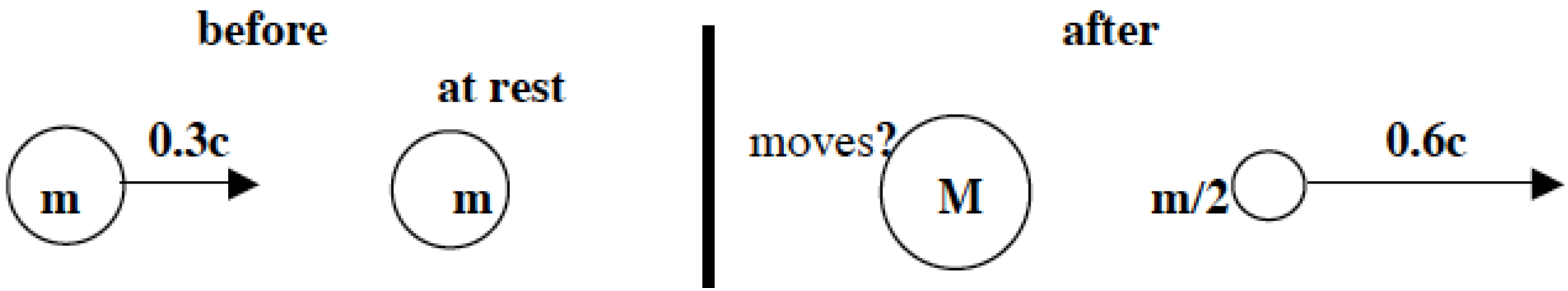
(d) $\hbar/(9a_0)$

(e) any of the above, depending on the values of n and Z

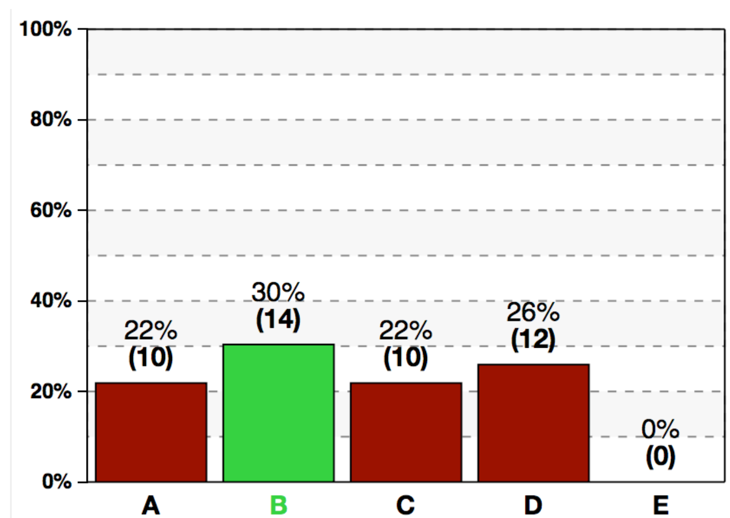
The de Broglie wavelength of an electron is the Compton wavelength, 0.0243A. Its momentum is

(a) $m_e c$
(b) $0.99 m_e c$
(c) $0.7 m_e c$
(d) $0.4 m_e c$
(e) $0.1 m_e c$

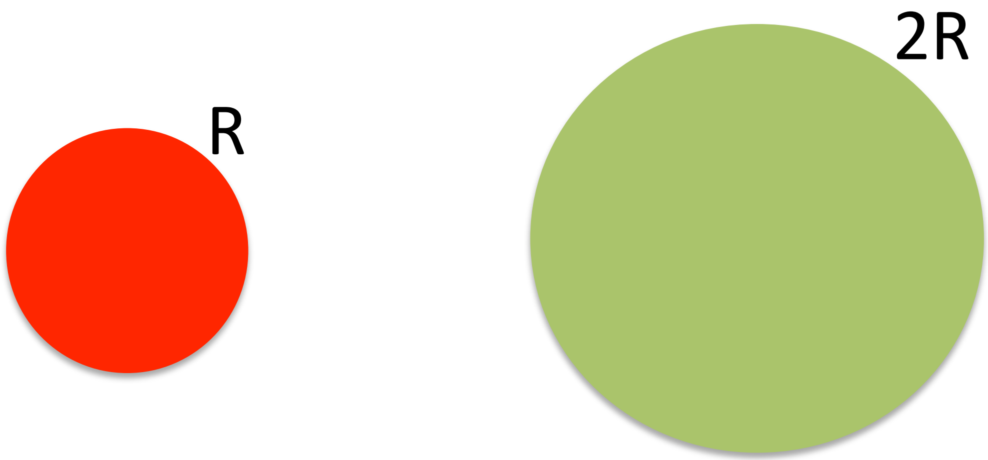


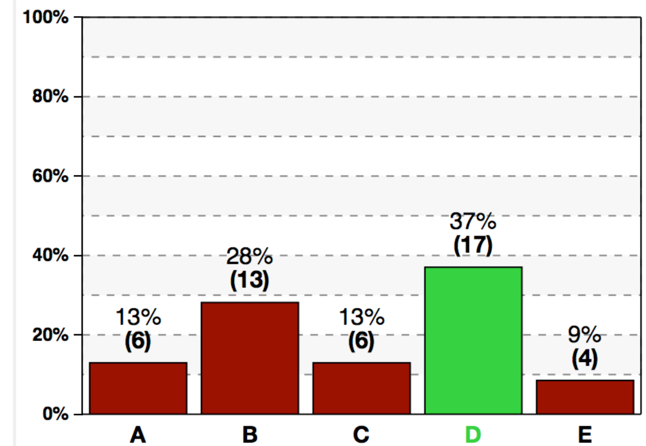


(a) M moves to the right
(b) M moves to the left
(c) M doesn't move
(d) Impossible, m/2 cannot move at 0.6c
(e) not sure



Assume these are black bodies at temperature T_1, T_2





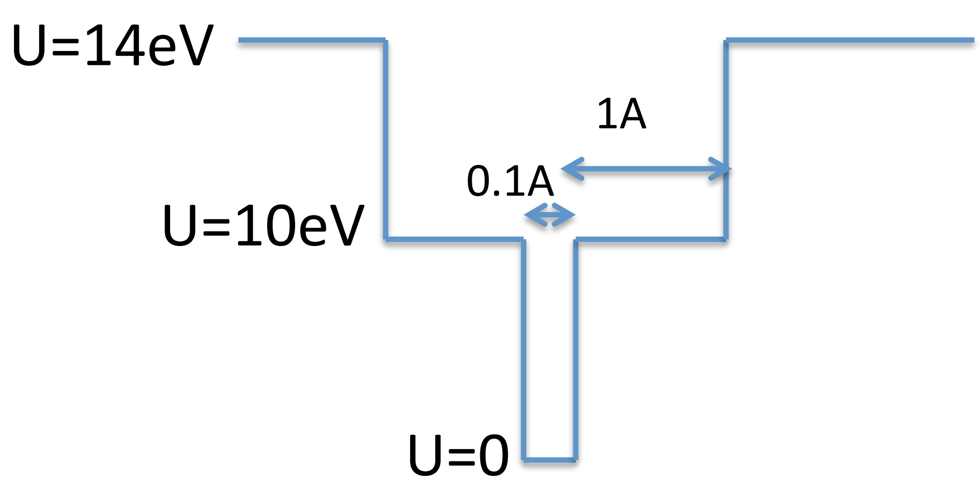
(a) the big ball emits 16 times more power than the small ball

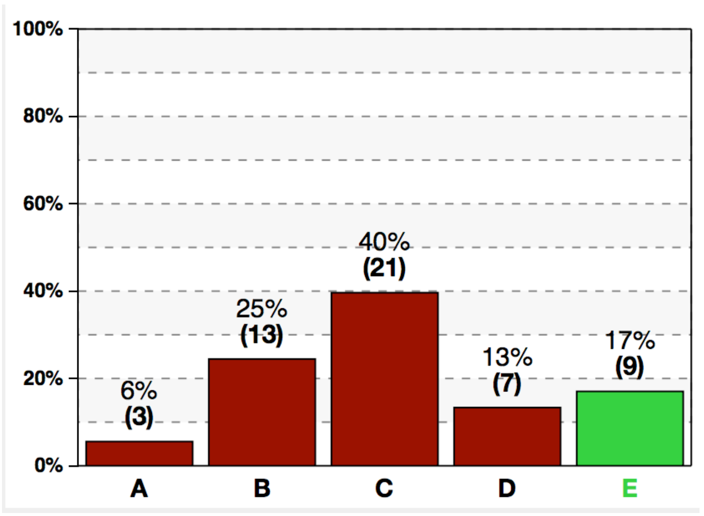
(b) the big ball emits less than 16 times more power than the small ball

(c) the big ball emits less radiation of red wavelength than the small ball

(d) the big ball emits more radiation of green wavelength than the small ball

(e) none of the above





An electron in a bound state of the potential well shown above can have energy

(a) 0eV
(b) less than 5eV
(c) between 5eV and 10eV
(d) between 10eV and 14eV
(e) electron can't be confined in that potential well