

## Formulas\_Quiz 4

### Formulas and constants

Mass of electron =  $9.1 \cdot 10^{-31}$  kg

Charge on electron =  $1.6 \cdot 10^{-19}$  C

Planck's Constant  $h = 6.626 \cdot 10^{-34}$  J.s =  $4.136 \cdot 10^{-15}$  eV.s

$\hbar = h / 2\pi = 1.055 \cdot 10^{-34}$  J.s =  $6.582 \cdot 10^{-16}$  eV.s

1 eV =  $1.6 \cdot 10^{-19}$  J

Coulomb's constant  $k = 1 / (4\pi\epsilon_0) = 8.99 \cdot 10^9$  N.m<sup>2</sup> / kg<sup>2</sup>

Velocity of light  $c = 3 \cdot 10^8$  m/s

Bohr's quantization for Angular momentum  $mvr = n\hbar$

Bohr radius  $a_0 = 0.529 \cdot 10^{-10}$  m

1 Rydberg (Energy required to ionize hydrogen atom) = 13.6 eV

Rydberg Constant  $R = 1.097 \cdot 10^7$  m<sup>-1</sup>

Energy of photon  $E = hf$

For photon  $\lambda f = c$

Force due to Electric field :  $\mathbf{F} = q\mathbf{E}$

Force due to Magnetic Field:  $\mathbf{F} = q\mathbf{v} \times \mathbf{B}$

Drag Force on drop of radius  $\alpha$  and velocity  $v$  in medium of viscosity  $\eta$

(always opposite to direction of  $v$ ) :  $D = 6\pi\alpha\eta v = Cv$