

## Level 3 Modern Physics

Things to remember before the test – if your teacher is assessing you by a test.

1. Most equations are only used once so highlight an equation once you have used it. Any constants you need e.g.  $h = 6.63 \times 10^{-34}$  will be given to you.
2. You must convert quantities into **SI** before using them (e.g.  $2 \text{ cm} = 2 \times 10^{-2} \text{ m}$ ,  $2 \text{ cm}^2 = 2 \times 10^{-4} \text{ m}^2$ ) in an equation. Remember prefixes ( $n = 10^{-9}$ ,  $\mu = 10^{-6}$ ,  $m = 10^{-3}$ ,  $c = 10^{-2}$ ,  $k = 10^3$ ,  $M = 10^6$ ,  $G = 10^9$ )
3. If you can't remember the units, use the units on the other side of the equation e.g.  $h = E/f$  so Planck's constant,  $h$  has units of  $\text{J (from } E) \div \text{s}^{-1} \text{ (from } f)$  i.e.  $\text{J s}$
4. If it's "light" falling on a metal, it's the photoelectric effect.
5. In the photoelectric effect, **one** photon causes **one** electron to be released
6. In the photoelectric effect the current tells you how many electrons are emitted
7. **eV<sub>s</sub>** is NOT electron-volts (it's  $1.6 \times 10^{-19}$  x stopping voltage)
8. The wavelength of white light is shifted to red if going away from you and blue coming towards (like a modern car with halogen lights)
9. Remember My Instructions Visible Under X-ray Glasses (is in order of increasing  $f$  and  $E$ )
10. Red 700 nm, Blue 400 nm
11. The Bohr and Rydberg models only really work for Hydrogen
12. The transition for hydrogen to  $n = 2$  (Balmer) is visible light
13. The mass deficit is the mass between the "reactants" and "products" of a nuclear reaction – use a calculator to deal with the 7 sig figs
14. The energy released is the mass deficit multiplied by  $c^2$
15. Binding energy is released when nucleons create a nucleus (conjoined twins aren't quite enough mass to make two separate individuals)
16. Binding energy per nucleon = binding energy/number of nucleons