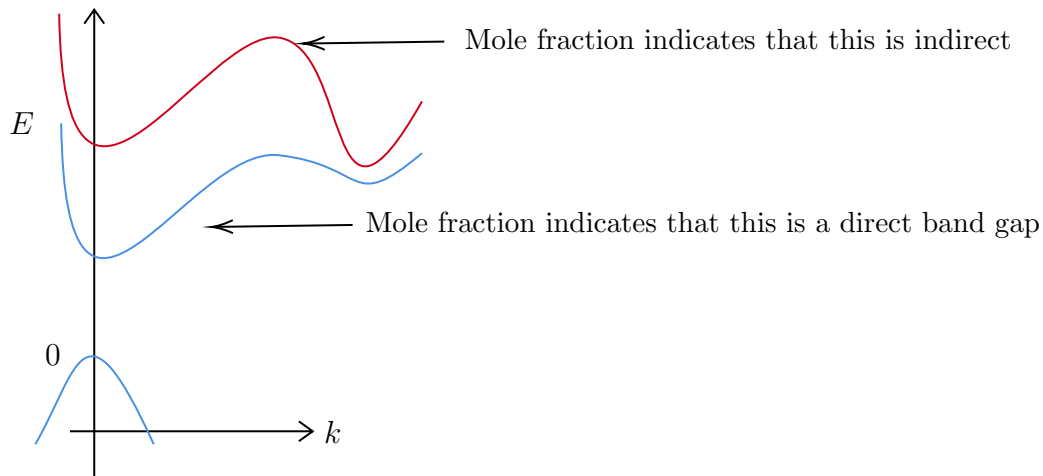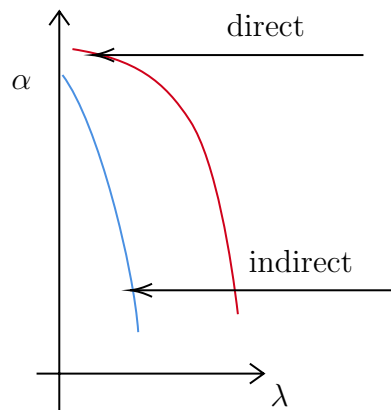# Q 1:

The probability of a direct band to band radiative recombination in a direct band-gap material is way more than the probability of an indirect band-gap material. From the plot, we can see how difficult it is to emit light when the material is indirect band gapped
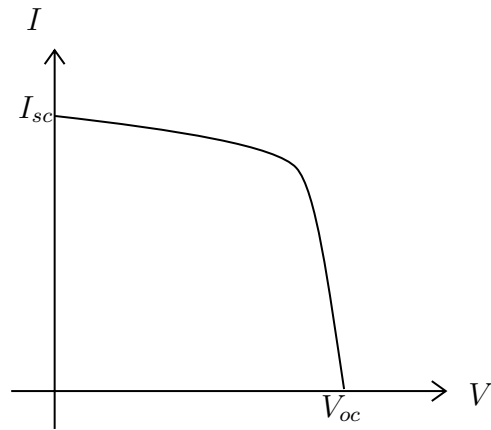

Q 2:

Indirect band-gap material will need less thickness

1 Q 3:

Solar cells are devices made of p-n junction, when they absorb light they can be used convert it into current and thus store it into a battery for example

$$\eta = \frac{I_m V_m}{P_0} \times 100\%$$

2   Q 4:

$$\lambda = \frac{hc}{E_g} \implies E_g = \frac{1.24\,\mu m}{850\,nm} = 1.46\,eV$$

$$E_g = 1.424 + 1.247x\,eV \implies x = 0.028$$