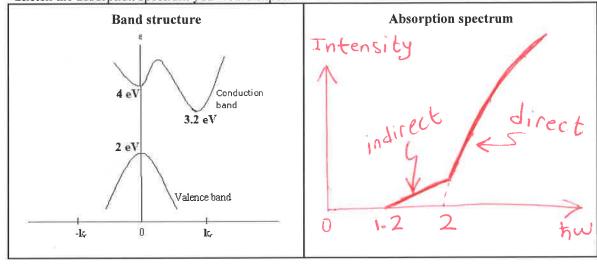
Week 8 - Semiconductors **Comprehension Check**

Total points = 25 (scaled by a factor of 1/10 in the system)

Question 1 (8 points)

Sketch the absorption spectrum you would expect for the material with the band structure shown below.



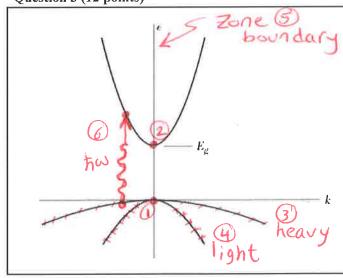
Question 2 (5 points)

Discuss what distinguishes a semiconductor from an insulator. Be brief.

Size of the bandgap relative to thermal energy

KBT> Eg => Semiconductor

Question 3 (12 points)



Annotate the figure to highlight the following:

- Top of valence band
- Bottom of conduction band
- Band where holes are "heavy"
- Band where holes are "light"
- Vertical line representing the zone boundary
- A direct transition where photon energy $h\omega > E_{\rm g}$