

Module IV: Quiz

- 1. What is the origin of the energy bands in crystals?**
- 2. As a model, a hole may be seen as a moving elemental positive charge in the lattice, agreed?**
- 3. If so, is it somehow similar to an ionized hydrogen atom – a proton – moving in the lattice? In fact, in some fields of chemistry one may probably hear this sort of analogy.**
- 4. What the hole really is from the principles of solid state physics?**
- 5. What is the meaning of the negative effective mass?**
- 6. As a model, a hole may be seen an empty orbital in the valence band of a semiconductor. Does it hold for empty orbitals in the conduction band? If not, why?**
- 7. At low temperature, assume close to 0K, an intrinsic semiconductor acts as an isolator. Assume this material is doped with donors and its electrical conductivity is re-measured, again at 0K. Would this material conduct?**
- 8. What is the depletion region in a p-n junction?**
- 9. What is the temperature limitation for having rectifying properties of the p-n junction?**