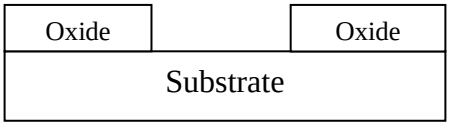
NAN 242

Midterm 3 - Sample Questions

1. Describe an electromagnetic wave in free space. Alternatively, what parameters would define a wave?
2. How would you label an electromagnetic wave with a wavelength of 620 nm. How about one with a frequency of 100 Mhz?
3. What is dispersion?
4. Describe sunlight by its wavelength and polarization.
5. Describe thin film interference.
6. Sketch a spectrometer and its components.
7. If a 620 nm photon has an energy of 2 eV, what is the energy of a 1000 nm photon?
8. Describe the photoluminescence process.
9. What type information is gained from Raman spectroscopy? What would be an alternative method?
10. Which property of light is used in ellipsometry? What kind of information about the sample can be gained by it?
11. How does a photomultiplier tube work?
12. What are the two types of x-ray analyzers? Describe the operation of one.
13. Describe Auger Electron Spectroscopy. What is it used for, what is its main disadvantage?
14. Why is a 4-point probe more advantageous than a simple 2-point one for resistance measurements?
15. How does internal stress deform a thin film? If you want to test a film for internal stress, which technique would you use?
16. What are the three types of alignment systems for exposure in photolithography?
17. Starting with the bare substrate, write or sketch the photolithography steps to lay down a pattern that looks like the one on the left.



18. Name three changes to current photolithography technology that need to be made in order to move to EUV lithography.