

**1. Modify the following text so that the statement is true.**

When the electron concentration is much larger than the holes concentration the semiconductor is called (     ) type.

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**2. Consider a light wave traveling in a medium of pure Si. The wavelength of the light is 2.15  $\mu\text{m}$  and the refractive index at this wavelength is 3.45. Calculate the phase velocity of the light wave.**

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**3. Consider a ray of light traveling in a medium of refractive index  $n_1 = 1.43$  becomes incident on a second medium of refractive index  $n_2 = 1.45$ . Calculate the incident angle to have TIR.**

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**4. Calculate the range of wavelengths not absorbed by Silicon (Si). The bandgap of Si = 1.11 eV.**

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**5. Fill the table indicating the color of light associated to the wavelength values**

wavelength	color
400 nm	
550 nm	
600 nm	
700 nm	

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**6. List three basic parameters of fibre optics that justify its application in data transmission systems.**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

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**7. Modify the following text so that the statement is true.**

Laser diodes are based on the ( **stimulated** / **spontaneous** ) emission principle.

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**8. Fill the table indicating one application for each one of the optoelectronic devices cited on the first row.**

wavelength	application
LEDs	
Solar cells	
Laser diodes	
Photodiodes	

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**9. Modify the following text so that the statement is true.**

The electrical conductivity of a metal material ( **decreases** / **increases** ) with increasing temperature

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**10. Modify the following text so that the statement is true.**

A photon is absorbed by a semiconductor if the photon energy is ( **greater** / **lower** ) than the band gap of the material, Eg.

