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.

1. Consider a light wave traveling in a medium of pure Si. The wavelength of the light is 2.15 µm and the refractive index at this wavelength is 3.45.

Calculate the phase velocity of the light wave.

1. Consider a ray of light traveling in a medium of refractive index n1= 1.43 becomes incident on a second medium of refractive index n2= 1.45. Calculate the incident angle to have TIR.
2. Calculate the range of wavelengths not absorbed by Silicon (Si).

The bandgap of Si = 1.11 eV.

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

|  |  |
| --- | --- |
| **wavelength** | **color** |
| 400 nm |  |
| 550 nm |  |
| 600 nm |  |
| 700 nm |  |

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

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

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

1. 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 |  |

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

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

1. 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.