Department of Humanities and Sciences
National Institute of Technology Goa
Farmagudi, Ponda, Goa - 403 401

Subject: Material Science **Minor-I** **Time: 45 Minutes**
Course Code: PH150 **Max Marks: 10**

Answerer all the questions

1.	If cubic structured Silicon doesn't have permanent dipoles, Find the total polarisation and derive the polarisability for that material?	2 M
2.	An isolated Te atom has the atomic radius 12×10^{-7} m. Calculate the α_e?	1 M
3.	The relative dielectric constant of Ne gas is 1. If the gas contains 2.7×10^{25} atoms m^{-3} at 0 °C and 1 atmospheric pressure, calculate its polarisability.	1 M
4.	If a NaCl is subjected to an electrical field of 1000 V m^{-1} and relative permittivity 5.86, calculate the resulting polarisation of NaCl.	1 M
5.	A Cu material has a magnetic field intensity of 10000 A m^{-1}. If the susceptibility of the material at room temperature is 2.7×10^{-3}, calculate the magnetisation and flux density of the material.	1 M
6.	If a material have $M/M_S=0.9$, What type material it is? and What is name of the that material?	1 M
7.	If a material susceptibility varies from 10^{-5} to 10^{-6}, what type of material it is? And derive the equation for susceptibility (Assume that the value of induced magnetic moment is very small, when there is an applied magnetic field)	2 M
8.	A material is subjected to a magnetic field of 10^{3} A/m strength. If the magnetic magnetisation is 0.3×10^{-3} A m^{-1}, calculate its susceptibility and magnetic flux density inside the material.	1 M