

M Tech. in Metallurgical Engg., 1styr 2nd Semester Examination, 2025

Electrical, Electronic and Magnetic Materials

Time: Three hrs

Full Marks: 100

Answer any five questions from the following.

1. a) Discuss about the different mechanism of polarizations occur in a dielectric material.
b) Show that polarization is numerically equal to bound charge density.
c) Find an expression for the Lorentz Internal field for dielectric. 8+6+6
2. a) Discuss briefly about different types of magnetic materials.
b) Describe how saturation magnetization is dependent on Temperature. 12+8
3. Discuss briefly about the basic features of NTC sensors, their properties and applications. Cite some examples. 16+4
4. Briefly discuss about the basic features, properties and possible applications of a PLZT ceramics. Cite some examples. 16+4
5. Discuss about PTC thermistors, their properties, potential for applications with examples. 16+4
6. Describe the basic features, properties and applications of a ferrite ceramics. Draw the crystal structure. 14+6
7. a) Find the expectation value $\langle x \rangle$ of the position of a particle trapped in a box L wide.
b) Write short notes on Tunneling Effect and finite potential well. 10+10