

M. Tech in Material Engineering, 2nd Sem. Examination, 2017**Electrical and Electronic Materials**

Time: Three hours

Full Marks: 100

Answer any five questions from the following.

1. 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 Finite potential well and tunneling effect. 20
2. a) Discuss about the various type of polarizations occur in a dielectric materials.
b) Describe the basic features of a ferroelectric ceramics. 20
3. a) Discuss briefly the different types of magnetic materials.
b) Describe how saturation magnetization is dependent on temperature? 20
4. Briefly discuss about the basic features, properties, and possible applications of a PLZT ceramics. Cite some examples. 20
5. Describe the characteristics, basic properties, and potential for applications of a varistor. 20
6. Discuss briefly about NTC sensors, their properties, and their applications. 20
7. Describe the basic features, properties and applications of a ferrite ceramics. 20