

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER– III (NEW) EXAMINATION – SUMMER 2015**

**Subject Code: 2133901****Date: 02/06/2015****Subject Name: FUNDAMENTALS OF SOLID STATE TECHNOLOGY****Time: 02.30pm-05.00pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What is Unit Cell? Describe Seven Crystal System. **07**  
(b) What are the Features of Miller Indices? Draw the Miller Indices for (2 0 0) **07**
- Q.2** (a) Short Note: Defect in Solid Material. **07**  
(b) Describe the X-ray Diffraction technique for Identify Crystal Structure. **07**
- OR**
- (b) Describe: Applications of X-ray Diffraction technique. **07**
- Q.3** (a) Write a short note on Lattice Vibration in Solid. **07**  
(b) Explain thermal Heat Capacity in Solids. **07**
- OR**
- Q.3** (a) Write Einstein theory for molar heat capacity and explain it. **07**  
(b) Write a brief on limitation of Einstein theory. **07**
- Q.4** (a) Define the extrinsic semiconductor and explain with acceptor and donor level. **07**  
(b) Explain briefly on Band diagram of p-n Junction Diode **07**
- OR**
- Q.4** (a) Write a short note on Hall Effect with neat and clean diagram. **07**  
(b) Short note: Rectification of p-n Junction diode. **07**
- Q.5** (a) Give briefly application of dielectric material. **07**  
(b) What is polarization? Give the type of polarization in dielectric material. **07**
- OR**
- Q.5** (a) Describe: Magnetic material. **07**  
(b) Short note: optical and thermal property of semiconductor. **07**

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