

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (New) EXAMINATION – WINTER 2018****Subject Code: 2133901****Date: 28/11/2018****Subject Name: Fundamentals of Solid State Technology****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

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

		MARKS
Q.1	(a) Define Nano Crystalline solids.	03
	(b) Explain Millar Indices and draw (111) (101) indices in plane.	04
	(c) Define Unit Cell and hence explain Simple Crystal Structure. Mention the names of Seven Crystal System.	07
Q.2	(a) Write Applications of XRD.	03
	(b) Describe X-ray Diffraction Method. (With Diagram)	04
	(c) What is the different type of Bonds in Solids? Explain all briefly.	07
	OR	
	(c) Explain Einstein Theory of Molar Heat Capacity.	07
Q.3	(a) Briefly Describe Lattice Phonon.	03
	(b) Explain Reciprocal Lattice and its significance in Characterization.	04
	(c) Write a short note on Heat Capacity.	07
	OR	
Q.3	(a) Explain Donor Level in Semiconductor.	03
	(b) What is Tunneling and Resonant Tunneling?	04
	(c) Explain Defects in Solids and explain each briefly.	07
Q.4	(a) Define Composite Briefly.	03
	(b) What are the Optical and Thermal Properties of Semiconductor?	04
	(c) Explain Hall Effect and hence describe hall effect in P-type and N-type Semiconductor. (With Diagram)	07
	OR	
Q.4	(a) Differentiate Dielectric materials and Insulators.	03
	(b) Write short note on P-N Junction.	04
	(c) Define Semiconductor. Briefly discuss its types and hence explain Doping.	07
Q.5	(a) Explain the Structure of Ceramics.	03
	(b) Write a short note on Ferrites and Nano Magnets.	04
	(c) Describe Magnetic Materials and its properties.	07
	OR	
Q.5	(a) What is Ferro electricity? Explain.	03
	(b) Describe Structure of Polymer.	04
	(c) What are the Dielectric Properties of Solids? Explain with example.	07
