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**

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