Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) • EXAMINATION – WINTER 2016

Subject Code:2133901 **Date:02/01/2017**

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		**Short Questions**	**14**
	1	Define lattice point	
	2	What is crystal structure?	
	3	Define miller indices.	
	4	Define donor in semiconductor.	
	5	What is energy band gap?	
	6	Define interfacial angle.	
	7	How many unit cell parameters?	
	8	Define intrinsic semiconductor	
	9	Define extrinsic semiconductor	
	10	Draw plane for (001) miller plane	
	11	Define space charge polarization	
	12	What is dipole moment?	
	13	Define magnetic dipole moment.	
	14	Define ferromagnetic materials.	
Q.2	**(a)**	Define Unit cell, lattice plane and lattice space.	**03**
	(b)	Describe Seven Crystal System.	**04**
	(c)	What are the Features of Miller Indices? Draw the Miller Indices for (2 0 0)	**07**
		OR	
	(c)	Describe features of miller indices.	**07**
Q.3	**(a)**	Write applications of X-Ray diffraction technique.	**03**
	(b)	Write a short note on Lattice Vibration in Solid.	**04**
	(c)	Explain X-Ray diffraction technique.	**07**
		OR	
Q.3	**(a)**	Define electric field and electric flux.	**03**
	(b)	Describes defect in solids.	**04**
	(c)	Explain Bonds in solids.	**07**
Q.4	**(a)**	Define ferroelectricity.	**03**
	(b)	Write a brief on limitation of Einstein theory.	**04**
	(c)	Write Einstein theory for molar heat capacity and explain it.	**07**
		OR	
Q.4	**(a)**	Define superconductivity with example.	**03**
	(b)	Short note: Rectification of p-n Junction diode.	**04**
	(c)	Write a short note on Hall Effect with neat and clean diagram.	**07**
Q.5	**(a)**	Write types of dielectric.	**03**
	(b)	Write note on properties of dielectric	**04**
	(c)	Write short note on magnetic materials	**07**
		OR	
Q.5	**(a)**	Define composite with examples.	**03**
	(b)	Describe applications of dielectric material.	**04**
	(c)	What is polarization? Give the type of polarization in dielectric material.	**07**

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