GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VIII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2183606   **Date:09/05/2019**
Subject Name:Physical Ceramics
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)	Give definition of piezoelectric ceramic material.	03
	(b)	Differ between piezoelectric and ferroelectric material.	04
	(c)	Describe working principle of piezoelectric material.	07
Q.2	(a)	Explain the Hume Rothery rule of solid solubility.	03
	(b)	Differ between homogeneous and heterogeneous nucleation.	04
	(c)	Deduce the equation for the development of critical radius and corresponding free energy during the process of homogeneous nucleation.	07

OR

	(c)	Deduce the mathematical equation for crystal growth after homogeneous nucleation.	07
Q.3	(a)	Deduce the expression of atomic packing factor for FCC close packing.	03
	(b)	Differ between FCC and HCP packing.	04
	(c)	Describe the structure of UO_2. Why can it be used as nuclear fuel?	07

OR

Q.3	(a)	Describe refining process with examples.	03
	(b)	Describe annealing process in brief.	04
	(c)	Describe network former, intermediate and modifier with examples.	07

OR

Q.4	(a)	Define ferroelectric material.	03
	(b)	Describe the hysteresis curve of spontaneous polarization.	04
	(c)	Describe various polymorphs of Barium Titanate	07

OR

Q.4	(a)	Distinguish between homogeneous and heterogeneous nucleation.	03
	(b)	Deduce the mathematical model for heterogeneous nucleation	04
	(c)	Describe the hysteresis loop to explain polarization.	07

OR

Q.5	(a)	Defin chrome ore.	03
	(b)	Describe properties of chrome ore.	04
	(c)	Describe chrome ore structure	07

OR

Q.5	(a)	Describe alumina structure.	03
	(b)	Deduce the mathematical model for crystal growth.	04
	(c)	Describe the modus operandi of glass tank furnace.	07

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