

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019****Subject Code: 2173905****Date: 30/11/2019****Subject Name: Electrical and Optical properties of Nanomaterials****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 Plasmon.	03
	(b) Write Applications of Core-Shell Nanostructures.	04
	(c) Explain Four Probe and Two Probe Method.	07
Q.2	(a) Define Polarization.	03
	(b) Write note on Applications of Electrical Properties of Nanomaterials.	04
	(c) Write short note on Photo-Catalytic Property of Nano materials.	07
	<b>OR</b>	
	(c) Explain Optical Properties of Metallic Nano-particles. Also Describe the Variation in Properties with Size.	07
Q.3	(a) What are Negative Refractive Index Structures?	03
	(b) Explain Mechanism of Photo Catalysis in Semiconductor Nanoparticles.	04
	(c) Write note on Applications of Optical Nanomaterials.	07
	<b>OR</b>	
Q.3	(a) What is the Role of the Shell in Case of Semiconductor on Semiconductor Core-Shell Nanostructure?	03
	(b) Write note on Applications of Optical Properties of Nanomaterials.	04
	(c) Explain Electrical Transport Property of Nanomaterials.	07
Q.4	(a) What are Dielectric Materials? Differential Polar and Non-polar Dielectric Materials.	03
	(b) What is Photoluminescence?	04
	(c) How sintering temperature affect optical property of nano material? Explain it.	07
	<b>OR</b>	
Q.4	(a) If the Relative Permittivity and Permeability of Material is 9 and 1 Respectively, What will be the Refractive Index of the Material?	03
	(b) Explain Various Light Absorption Mechanisms in Materials.	04
	(c) Write short note on Applications of Opto-Electronic devices Highlighting the Optical and Electrical Properties of Nanomaterials.	07
Q.5	(a) What is the Effect of Sintering Temperature on the Optical Properties of CdO Nanoparticles?	03
	(b) What is Exciton? Explain.	04
	(c) Explain Optical Properties of Semi-Conducting Nano-particles. Also Describe the Variation in Properties with Size.	07
	<b>OR</b>	
Q.5	(a) Explain Origin of Permittivity and Permeability of Medium.	03
	(b) Explain Electrical Conductivity of Thin Films.	04
	(c) Explain Properties of Semiconductor on Semiconductor Core-Shell Structures.	07