AR 24 Reg. No | | | | | | | | | | |

GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

Ph.D. (Second Semester-Summer) Examinations, May – 2025

PPEPH2024/23SPPEPH2012 – Dielectric and Impedance Spectroscopy and Application

(Physics)

Time: 3 hrs Maximum: 70 Marks

The figures in the right hand margin indicate marks.

	Answer *ANY FIVE* Questions. (14 x 5 = 70 Marks)	**Marks**
1.a.	Define Polarization? Discuss charge polarization.	7
b.	Define space. dielectric and ionic relaxations	7
2. a.	Mention the types of magnetic materials with their properties. Give examples.	7
b.	Explain quantum theory of paramagnetic materials.	7
3.a.	Define ferromagnetism. Derive Curie-Weiss law in ferromagnetic materials.	8
b.	Write the theory details of Van-vleck Para magnetism.	6
4.a.	Differentiate between ferroelectric and multiferroelectric materials with their applications.	8
b.	Discuss different methods for the measurement of dielectric permittivity and impedance.	6
5.a.	Discuss the transport mechanism in different types of dielectric materials..	8
b.	Write short notes on linear & nonlinear dielectrics.	6
6.a.	Discuss in detail about the device application of ferroelectric ceramics	6
b.	Explain the synthesis of materials by Solid state route and chemical route.	8
7.	Mention the Ferroelectric Thin Films and Electro-optic Applications Write short notes on (i) Transducer and (ii) Actuator.	14
8.a.	Why a Perovskite material is considered as a suitable candidate for photovoltaic application?	7
b.	What is a memory device? Write different memory devices with their applications.	7

---End of Paper---