Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Winter Examination-2022

Subject Name: Electricity and Magnetism

Subject Code: 4SC03ELM1 **Branch: B.Sc. (Chemistry, Mathematics)**

Semester: 3 **Date: 28/11/2022** **Time: 11:00 To 02:00** **Marks: 70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

a) Define the term Hall Voltage
b) What do you mean by Polarization of EM waves?
c) Sketch a typical hysteresis loop for a magnetic material
d) What is Curie Temperature in ferromagnetics?
e) State Gauss' law in electricity
f) Define the term electric dipole
g) Define: Magnetic Vector Potential
h) Differentiate between permittivity and permeability
i) Define the term dielectric constant (k)
j) What can you say on Electric Field and Electric Potential value inside a Charged Sphere?
k) How is electric flux different from magnetic flux?
l) Give the general expression for Biot- Savart's law
m What is Magnetic Susceptibility?
n) Define Coercivity

Attempt any four questions from Q-2 to Q-8

Q-2 **Attempt all questions** **(14)**

A Deduce the expression for Gauss' law in electricity with necessary figure **7**
B Elaborate on dielectrics **7**

Q-3 **Attempt all questions** **(14)**

A Explain how a parallel plate condenser works and derive the general expression for capacitance for the same. **7**
B Deduce the expression for potential of an electric dipole with suitable figure **7**

Q-4 **Attempt all questions** **(14)**

A State Ampere's Circuital law and apply it to find B for a solenoid carrying current **7**
B Derive the mathematical relation between Magnetic Permeability and Susceptibility. **7**

Q-5		**Attempt all questions**	**(14)**
	A	Find magnetic field for a current carrying straight conductor using Biot Savart's law	**7**
	B	Compare the properties of Para and Dia magnetic materials	**7**
Q-6		**Attempt all questions**	**(14)**
	A	Explain in detail Ferro magnetic materials	**7**
	B	Give an account on hysteresis loop	**7**
Q-7		**Attempt all questions**	**(14)**
	A	Write the expressions for Maxwell's equations and explain any one of them	**7**
	B	Explain Hall effect with necessary diagram	**7**
Q-8		**Attempt all questions**	**(14)**
	A	Explain the term Poynting's Vector in detail	**7**
	B	Write a note on energy loss due to hysteresis	**7**