Enrollment No: _____   Exam Seat No: _____

C.U.SHAH UNIVERSITY
Summer Examination-2018

Subject Name: Electricity and Magnetism

Subject Code: 4SC03PHC2   **Branch: B.Sc. (All)**

Semester: 3   **Date: 04/04/2018**   **Time: 02:30 To 05:30**   **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) Differentiate between permittivity and permeability
    b) What is Magnetic Susceptibility?
    c) Define the term hysteresis
    d) What do you mean by self-inductance of a coil?
    e) Differentiate between electric and magnetic flux
    f) Define Capacity of a conductor
    g) What do you mean by potential gradient?
    h) Explain Magnetic Induction briefly.
    i) What is Curie Temperature in ferromagnetics?
    j) Define Retentivity
    k) Give the unit of Electric Field Intensity
    l) What can you say on Electric Field and Electric Potential value inside a Charged Sphere?
    m) Define the term electric dipole
    n) Define Hall voltage

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

Q-2	**Attempt all questions**	**(14)**
a	Derive the expression for Electric field strength or intensity	**07**
b	State and prove Gauss' theorem	**07**

Q-3	**Attempt all questions**	**(14)**
a	Explain the term electric potential in detail.	**07**
b	Deduce the expression for potential due to an electric dipole	**07**

Q-4	**Attempt all questions**	**(14)**
a	Derive a general expression for capacity of a parallel plate condenser	**08**
b	A uniformly charged sphere has a total charge of 300µC and a radius of 8 cm. Find the electric intensity at (1) A point 16 cm away from the centre of the sphere.	**06**

(2) At a point on the surface of the sphere

Q-5		**Attempt all questions**	**(14)**

Q-5 **Attempt all questions** **(14)**
    a   Explain Hall effect in detail **08**
    b   Deduce the relation between Magnetic Susceptibility and Permeability **06**

Q-6 **Attempt all questions** **(14)**
    a   Differentiate between Paramagnetic and Diamagnetic Substances **07**
    b   Discuss on the term Hysteresis Loop in detail **07**

Q-7 **Attempt all questions** **(14)**
    a   Explain in detail Ferro magnetic materials **06**
    b   Give an account on energy loss due to hysteresis **08**

Q-8 **Attempt all questions** **(14)**
    a   Differentiate between Self and Mutual Inductance, derive $M=\sqrt{(L_1 L_2)}$, where M is mutual inductance, L_1 and L_2 are self-inductances of two coils. **07**
    b   Write a note on magnetic field due to a current carrying conductor **07**