F.Y.B.Sc. SEM – II (CBCS 2018 COURSE) : SUMMER - 2019
SUBJECT: PHYSICS: ELECTRICITY AND MAGNETISM

Day : Saturday		**Time :** 11.00 A.M TO 02.00 PM	
Date : 04/05/2019	**S-2019-0786**	**Max. Marks : 60**	

N.B.
1) All questions are **COMPULSORY**.
2) Figures to the **RIGHT** indicate **FULL** marks.
3) Draw neat diagrams wherever **NECESSARY**.

Q 1. Attempt any **Two** of the following.　　　　　　　　　　　　　**(12)**
　(a) Obtain an expression for $\bar{B}$ on the axis of a current carrying circular coil.
　(b) Distinguish between Paramagnetic, Diamagnetic and Ferromagnetic materials.
　(c) Using Gauss's law, obtain an expression for the electric field intensity at a point due to charged plane conductor.

Q 2. Attempt any **Two** of the following.　　　　　　　　　　　　　**(12)**
　(a) State Biot-Savart's law and obtain an expression for it.
　(b) Explain the term Magnetic Susceptibility and magnetic permeability.
　(c) Calculate the force between two balls each having a charge of 12 μC and are 8 cm apart.

Q 3. Attempt any **Two** of the following.　　　　　　　　　　　　　**(12)**
　(a) What are polar and non-polar molecules? Explain with examples. Also write the effect of electric field on polar and non-polar molecules.
　(b) Obtain the relation between $\bar{B}, \bar{M}$ and $\bar{H}$.
　(c) An aluminum wire of radius 0.2×10^{-2} m carries a current of 25 A. Find the magnetic field at the surface of wire.

Q 4. Attempt any **Three** of the following.　　　　　　　　　　　　**(12)**
　(a) Draw and explain Hysteresis curve in details.
　(b) What is electric intensity? Obtain an expression for electric intensity due to a point charge at any point.
　(c) State Coulomb's law in electrostatics and obtain expression for it.
　(d) A charge of 12 nano-coulombs is situated inside a cube. Calculate the electric flux through one of the faces of the cube. (Given: $\varepsilon_0 = 8.85 \times 10^{-12}$ C^2/Nm^2).

Q 5. Attempt any **Four** of the following.　　　　　　　　　　　　**(12)**
　(a) What is magnetic flux? Explain Gauss's law for magnetism.
　(b) State the limitations of Coulomb's law in electrostatics.
　(c) Define: magnetization, magnetic intensity and magnetic induction.
　(d) State and explain Ampere's circuital law.
　(e) Define the term magnetic field. Also obtain an expression for magnetic force.
　(f) Show that electric polarization P is equal to surface charge density of induced charge.

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