2nd Semester (B.Sc.-G) Final Internal Examination-2020
Department of Physics
Prabhat Kumar College, Contai
Paper-DSC-1B (Electricity and Magnetism)

Group-A (Theory)
(Answer any one of the following)

1. A) State and explain the Lenz's law of electromagnetic induction. B) For two inductances connected in parallel, calculate the equivalent inductance assuming that the mutual flux aids the self-flux.
2. A) What is toroid? Apply Ampere's circuital law to determine the magnetic field inside and outside of a toroid. B) State and explain the Biot-Savart law. Using this calculate the magnetic field due to the current in a straight wire of finite length.
3. What is Lorentz force? A long straight conductor carries a current I. Determine the force per unit length of the conductor when it is placed in a uniform magnetic field $\vec{B}$.
4. What is the differential form of Gauss's law? Apply Gauss's law to calculate the electric field in the case of a charged infinite plane.
5. Determine the potential energy of a dipole in an external electric field. Also calculate the torque on the dipole in a uniform electric field.
6. State and prove Poynting's theorem.

Group-B (Practical)
(Answer any one of the following)

1. For determine an unknown Low Resistance using Carey Foster's Bridge, write down the theory and draw the circuit diagram of this experiment.
2. For measurement of field strength B and its variation in a solenoid (determine dB/dx), write down the theory with working formula, draw circuit diagram and procedure of error calculation.
3. For verify the Superposition, and Maximum power transfer theorems, write down the theory, working formula and procedure of this experiment.
4. For verify the Thevenin and Norton theorem, write down the theory and draw the circuit diagram of this experiment.
5. For study a series LCR circuit and determine its (a) Resonant Frequency, (b) Quality Factor, write down the theory and draw the circuit diagram of this experiment.

Answer script submitted to goutammanna84@gmail.com