

**April 2025**  
**B.A./B.Sc.**  
**Second Semester**  
**MINOR – 2**  
**PHYSICS**  
*Course Code: PHN 2.11*  
(Electricity & Magnetism)

Total Mark: 50

Pass Mark: 20

Time: 2 hours

I. Answer the following questions.

**UNIT-I**

1. (a) What is electric flux? Obtain the expression of electric flux in uniform as well as non-uniform electric field. 1+3=4
- (b) Apply Gauss's law to find the electric field due to a uniformly charged solid sphere at different points on the sphere. 6
- (c) What is a capacitor? Mathematically, express the capacitance of a capacitor. 2

**UNIT-II**

2. (a) Apply Biot-Savart's law to find the magnetic field on the axis of a current loop. 5
- (b) What is a toroid? Use Ampere's circuital law to find the magnetic field due to a toroid. 4
- (c) Define magnetic flux and state Faraday's laws of electromagnetic induction. 3

**UNIT-III**

3. (a) Discuss growth of current in series LR circuit with direct current. 5
- (b) State and establish Thevenin's theorem. 5
- (c) Define the term dead beat in a moving coil galvanometer and state the conditions for the galvanometer to be dead beat. 2

II. Answer any two of the following questions.

4. What is an electric dipole? Obtain the general expression of electric potential due to a dipole and explain the special cases related to it. 1+6=7
  5. What is mutual induction? Prove the reciprocity theorem. 1+6=7
  6. Discuss series LCR circuit with alternating current. 7
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