

Second Semester Internal Examination, February 2026
Minor Course in PHYSICS
ELECTROMAGNETISM AND NETWORK THEOREMS
PHY2MN101

Time: 1 Hr

Max Marks: 35

Name :	Marks Scored	Section A		Total Marks
Class :		Section B		
Class No :		Section C		

Section A

(Each question carries 3 marks, Max marks for section – 7)

1. What are the significances of electric field lines? Draw an electric field line map of two slightly separated positive charges.
2. Explain Kirchhoff's laws.
3. Define ideal voltage source and ideal current source.

Section B

(Each question carries 6 marks, Max marks for section – 18)

4. Two point charges are located on the x- axis of a coordinate system, $q_1 = 1.0 \text{ nC}$ is at $x = +2.0 \text{ cm}$, and $q_2 = -3 \text{ nC}$ is at $x = +4 \text{ cm}$. what is the total electric force exerted by q_1 and q_2 on a charge $q_3 = 5.0 \text{ nC}$ at $x = 0$?
5. "The electric field at a point does not depend on the charge at that point" Justify the statement
6. State and explain Thevenin's theorem.
7. Two batteries A and B are connected in parallel and load of 10Ω is connected across their terminals. A has an e.m.f. of 12 V and an internal resistance of 2Ω ; B has an e.m.f. of 8 V and an internal resistance of 1Ω . Use Kirchhoff's laws to determine the values and directions of the currents flowing in each of the batteries and in the external resistance. Also determine the potential difference across the external resistance.

Section C

(Answer any one question, each question carries 10 marks)

8. a) Define Principle of Superposition of Electric fields. b) Find the electric field at a point P on the perpendicular bisector of a uniformly charged rod. The length of the rod is 'L', the charge on it is Q and the distance of 'P' from the centre of the rod is 'a'.
9. State and explain maximum power transfer theorem. Show that the efficiency of maximum power transfer is 50%.

* Tie the question paper along with the answer sheets.