

Mechatronics and electrical drives

Exercise 1

In the given magnetic circuits, each coil is made up of 50 turns (N) and each winding carries a DC current $I = 10\text{A}$. The core is made up of iron (Fe) with a relative permeability of $\mu_r = 4000$. The cross section area (A) in each case is 2 cm^2 . The average iron path length (l_{Fe}) is mentioned at the corresponding figure.

- Draw the orientation of the flux (ϕ) in each circuit.
- Draw the electric equivalent circuits of the given magnetic circuits.
- Calculate the magnetic resistance (reluctance) to the resulting flux, the field strength in iron core and in the air gap, and the flux density in the iron core and air gap.

