

Lecture-18

Tutorial

Lecture Delivered by



Objectives

At the end of this lecture, student will be able to:

- Solve problems on Magnetic Circuits



Problem No 1

- Iron Ring of circular cross-sectional area of 3cm^2 and mean diameter of 20 cm is wound with 500 turns of wire and carries a current of 2.09A to produce magnetic flux of 0.5mWb in the ring. Determine the permeability of the material.



Problem No 2

- An iron ring 8 cm mean diameter is made up of round iron of diameter 1 cm and permeability of 900, has an air gap of 2mm wide. It Consists of winding with 400 turns carrying current of 3.5 A. Determine
 - ✓ M.M.F
 - ✓ Total Reluctance
 - ✓ The flux
 - ✓ Flux Density in ring



Problem No 3 & 4

- Flux density is 1.2T and the area is 0.25in^2 , determine the flux through the core ?
- A steel ring of 25 cm mean diameter has circular cross section of 3 cm diameter has a air gap of 1.5mm length. It is wound uniformly with 70 turns of wire carrying a current of 2 A. Calculate

1) M.M.F 2) Flux density

3) Magnetic Flux 4) Reluctance

5) μ_r for iron

Assume that iron path takes 30% of total m.m.f



Problem No 5

- A flux density of 1.2 Wb/m^2 is required in the 2 mm air gap of an electro magnet having an iron path of 1.5m. Calculate the ampere-turns required ,assuming a relative permeability of 1000 for the iron



Problem No 6

- A coil is uniformly wound with 300 turns over a steel ring of relative permeability 900 and mean diameter of 20 cm. The steel ring is made up of bar having cross-section diameter of 20cm. If a coil has resistance of 50Ω and connected to 250V DC supply, calculate
 - ✓ M.M.F
 - ✓ Field Intensity
 - ✓ Reluctance
 - ✓ Total Flux

