# Department of Electrical Engineering

**BEEG-1001** **Session:2020-21** **Tutorial sheet : 1**

**Electrical Engineering** **(Magnetic circuit) Odd Semester**

1. A coil of insulated wire of 500 turns and resistance of 4Ω is closely wound on an iron ring. The ring has a mean diameter of 0.25m and a uniform cross-sectional area of 700 $mm^2$. Calculate the total flux in the ring when a dc supply of 6V is applied at the ends of winding. Assume a relative permeability of 550.

   **[Ans: 0.462mWb]**

2. A ring of mean diameter 30 cm is wound with 200 turns of copper wire carrying a current of 2 A. The x-section of the magnetic material of the ring is 12 $cm^2$ and its relative permeability is 1,000. Determine theflux through it.

   **[Ans: 0.64 m Wb]**

3. A rectangular shaped core is made of mild steel plate 15 mm x 20 mm cross-section. The mean length of the magnetic path is 18 cm. The exciting coil has 300 turns and current 0.7 A. Calculate :

   (i) Magnetic field intensity(H)

   (ii) Flux density

   (iii) Reluctance

   (iv) Flux of magnetic circuit.

   Assume relative permeability of mild steel is 940.

   **[Ans: (i) 1,166.67 AT/m, (ii) 1.378 T (iii) 50.794 x $10^4$ AT/ Wb (iv) 4.134x$10^{-4}$Wb]**

4. An iron ring of mean diameter 10 cm is uniformly wound with 2000 turns of wire. When a current of 0.25 A is passed through the coil a flux density of 0.4 T is set up in the iron. Find

   (a) the magnetic field intensity

   (b) the relative permeability of theiron under these conditions.

   **[Ans: 1592 A/m, 200]**

5. What are the difference between electric and magnetic circuit?

6. Define the terms: (a) MMF (b) Field strength (c) Flux density (d) Relative permeability (e) Reluctance (f) Coercive force (g) residual flux density (h) leakage flux