SETHU INSTITUTE OF TECHNOLOGY
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Branch & Sem.	**:**	**EEE & V**	**SECTION**	**:**	**A&B**
Subject Code	**:**	**15UEE504**	**Date**	**:**	
Subject Name	**:**	**ELECTRICAL MACHINE DESIGN**	**UNIT**	**:**	**I & II**
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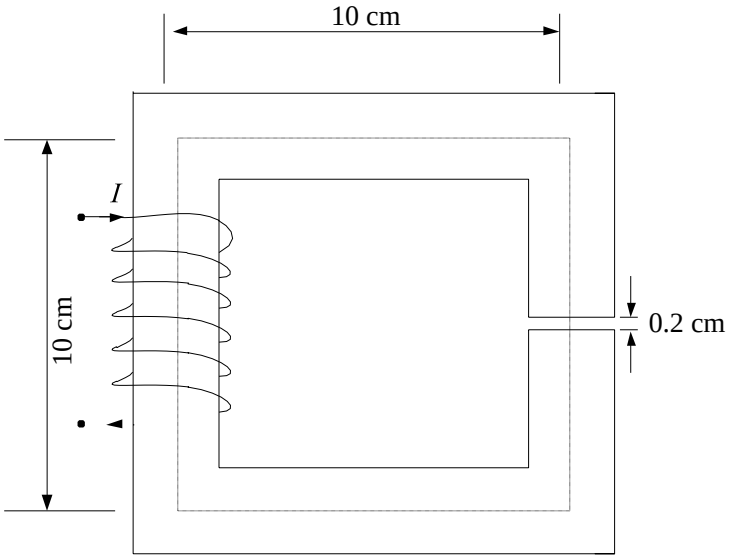
PT I Assignment Questions

1. The magnetic circuit shown below has uniform cross-sectional area and air gap of 0.2 cm. The mean path length of the core is 40 cm. Assume that leakage and fringing fluxes are negligible. When the core relative permeability is assumed to be infinite, the magnetic flux density computed in the air gap is 1 tesla. With same Ampere-turns, if the core relative permeability is assumed to be 1000 (linear), the flux density in tesla (round off to three decimal places) calculated in the air gap is_____. (**Analyzing**)



2. Determine the air gap length of a dc machine from the following particulars. Gross length of core is 0.12m, number of ducts is equal to one and is 10 mm wide, slot pitch is equal to 25 mm, slot width is equal to 10 mm carters coefficient for slot and ducts is equal to 0.32, gap density at pole center is equal to 0.1 wb/m2, field mmf/pole is equal to 3900 AT, mmf required for iron parts of magnetic circuit is equal to 800 AT. (**Analyzing**)

3. The heat dissipating surface of 8kW totally enclosed induction motor can be approximated at a cylinder 700mm in diameter and 1m in length. The motor can be considered to be made up of a homogeneous material weighing 400 kg and having specific heat of 725 J/kg/c. the specific heat dissipation from its surface is 12 W/m2/c. find the temperature rise of a machine at full load, if the efficiency is 90%. Predict the thermal time constant. (**Analyzing)**

4. Design the shunt field winding o f a 6-pole, 440V, DC generator allowing a drop of 15% in the regulator. Mmf per pole = 7200 AT; mean length of turn = 1.2m; winding depth=3.5cm; watts per sq.m. of cooling surface = 650. Calculate the inner, outer and end surfaces of the cylindrical field coil for cooling. Take diameter of the insulate wire to be 0.4mm greater than the bare wire. Assume 2 micro-ohm-cm as resistivity o f the copper at the working temperature. (**Creating)**