JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION

ELECTRICAL INSTRUMENTS AND SINGLE PHASE TRANSFORMER

ASSIGNMENT 3

1. The core of 5MVA 33kV/11kV, 50Hz single phase transformer has a core cross sectional area of $1m^2$. Find the primary and secondary turns of the coil, and emf per turn of the coil, if maximum flux density allowed can be 1.3 Tesla.

2. The core of 5MVA 33kV/11kV, 50Hz single phase transformer has turns ratio as calculated in the above problem. Find the primary and secondary current. Consider an ideal transformer.

3. A moving coil ammeter has full scale reading of 10A with internal resistance of 1800Ω. Find the shunt resistance to be put across the internal resistance to increase the range to 100A. Also find the multiplication factor. Prove that the voltage drop is same for the ammeter before and after adding shunt resistance.

4. The resistance of a moving coil voltmeter is 12KΩ. It has 90 turns and it is 25mm long and 15mm wide. The flux density in the air gap is $0.08Wb/m^2$. Calculate the deflection torque produced by the instrument when 230V is applied to the instrument. If 1.5×10^{-6} Nm of force is required for producing one radian deflection, find the deflection angle.