

### Assignments – Course Outcome matrix

**Course Outcomes (COs):**

CO-1 : Apply fundamental electrical laws and circuit theorems to electrical circuits.

CO-2 : Analyze single phase and three phase AC circuits.

CO-3 : Describe operating principle and applications of static and rotating electrical machines.

CO-4 : Understand the LT switchgear, earthing and safety of electrical appliances.

CO-5 : Comprehend illumination system, batteries, electrical consumption & billing and electrical measuring instruments.

Sr. No	Assignment	CO1	CO2	CO3	CO4	CO5
1.	Assignment-1	√				
2.	Assignment-2		√			
3.	Assignment-3			√		
4.	Assignment-4				√	
5.	Assignment-5					√

## Assignment : 3

1. Describe B–H curve and hysteresis loop with applications.
2. Explain ideal transformer and practical transformer.
3. Explain efficiency of transformer and derive its expression.
4. Compare ideal and practical transformer in detail.
5. A magnetic circuit consists of an iron core and a single air gap of 0.5 mm. If flux density in the air gap is  $1.2 \text{ Wb/m}^2$ , calculate the MMF required for the air gap alone.
6. The mean periphery of the steel ring is 70 cm and the cross-sectional area is  $6 \text{ cm}^2$ . Calculate the ampere turns necessary to produce flux of 0.9 mWb. If a saw cut of 3 mm is made in the ring and if the MMF remains constant, calculate the new value of the flux. Take  $\mu_r$  of steel as 1400.
7. Find the ampere turns required to produce a flux of 0.6 mWb in the air gap of a magnetic circuit which has an air gap of 0.3 mm. The iron ring has a cross section of  $6 \text{ cm}^2$  and 70 cm mean length. Take  $\mu_r = 2000$  and leakage coefficient = 1.2
8. An iron core operates at frequency = 50 Hz, maximum flux density =  $1.3 \text{ Wb/m}^2$ , Volume =  $0.01 \text{ m}^3$ , hysteresis coefficient is 0.003 Calculate hysteresis loss.
9. A single-phase transformer has 400 primary turns and 100 secondary turns. If primary voltage is 240 V, calculate: (a) Secondary voltage, (b) Turns ratio
10. The iron loss of a transformer is 300W and copper loss at full load is 400W. Calculate efficiency at full load and 0.8 power factor.
11. A transformer has no-load loss of 200 W and full-load copper loss of 300 W. At what load will the transformer have maximum efficiency?
12. Find the percentage regulation of a transformer supplying a unity power factor load if secondary induced voltage is 220 V and terminal voltage is 210 V.

**Rubric wise marks obtained:**

Criteria	Level of Knowledge and Understanding	Analytical Ability	Quality & Correctness of Write-up, Ethical Practices and Submission	Total
<b>Marks</b>				