

**Centurion University of Technology and Management,
Paralakhemundi**

Course: Basic Electrical Engineering (CUTM 1057)

Assignment 1

1. State the laws on which mesh current and node voltage analysis are based.

2. Derive the expressions for equivalent resistance in case of star to delta and delta to star conversion.

3. Determine the RMS, average value, Form factor and peak factor for half wave rectifier output.

4. A mild steel ring has a mean diameter of 30 cm and cross sectional area of 450 mm². Calculate the reluctance of the ring. Assume relative permeability of the mild steel is 1100.

5. Compare and contrast single-phase and three-phase power systems. Discuss the advantages of three-phase systems over single-phase systems in terms of power generation, transmission, and utilization. Also, explain the concept of phasor diagrams and their applications in three-phase circuit analysis.

6. Investigate the concept of power factor in AC power systems. Define power factor and discuss its importance in efficient power transmission. Calculate the power factor of a given circuit, identify leading or lagging power factor, and propose methods for power factor correction.