ELECTRICAL MEASUREMENT & MEASURING INSTRUMENTS

UNIT 2

Instrument Transformers

Current Transformer (CT)

- The secondary winding has very small load impedance which is the current coil of ammeter. The primary side has a few number of turns and the secondary side has large number of turns. The primary winding carries a full load current and this current is stepped down to a suitable value which is within the range of ammeter.

Burden of Instrument Transformer

- The operation of current transformer differs slightly from the power transformer. In case of current transformer, the secondary winding has a very small impedance or “Burden” , so the current transformer operates on short circuit conditions.
- The rated burden of this Instrument Transformer is the volt- ampere loading which is permissible without errors exceeding the limits.

Burden of Instrument Transformer

- Burden across the secondary of an instrument transformer is also defined as the ratio of secondary voltage to secondary current.

Z_L = secondary voltage/ secondary current

= V / I

The units of burden are ohms.

Phasor Diagram

Taking flux φ_m as the reference vector, the induced e.m.f. in the primary and secondary sides are E_1 and E_2 lagging behind the flux by 90^o are drawn. The magnitudes of e.m.f. are proportional to their respective number of turns.

The no load current I_o drawn by the primary has two components, magnetising component I_m and the working component I_w .