SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 19EE605 PROTECTION AND SWITCHGEAR

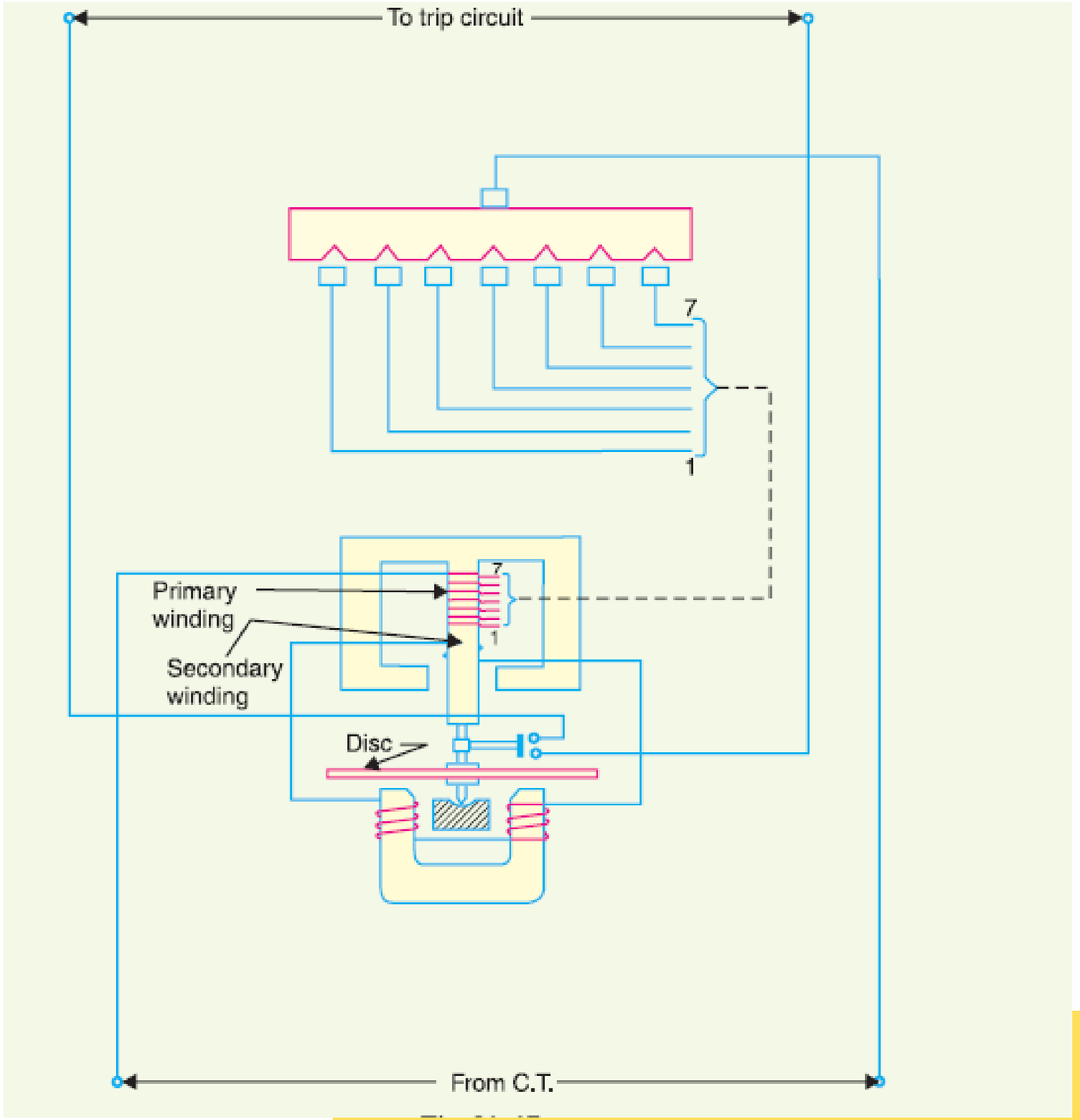
III YEAR /VI SEMESTER

Unit 2- ELECTROMAGNETIC RELAY

Topic: Induction Type Overcurrent Relay (non-directional)

Induction Type Overcurrent Relay (non-directional)

- This type of relay works on the induction principle and initiates corrective measures when current in the circuit exceeds the predetermined value.
- The actuating source is a current in the circuit supplied to the relay from a current transformer.
- These relays are used on a.c. circuits only and can operate for fault current flow in either direction.


To trip circuit
7
1
Primary winding
Secondary winding
7
1
Disc
From C.T.

Construction:

- It consists of a metallic (aluminium) disc which is free to rotate in between the poles of two electromagnets.
- The upper electromagnet has a primary and a secondary winding.
- The primary is connected to the secondary of a C.T. in the line to be protected and is tapped at intervals.
- The tappings are connected to a plug-setting bridge by which the number of active turns on the relay operating coil can be varied, thereby giving the desired current setting.
- The secondary winding is energised by induction from primary and is connected in series with the winding on the lower magnet. The controlling torque is provided by a spiral spring.

Operation:

- The driving torque on the aluminium disc is set up due to the induction principle.
- This torque is opposed by the restraining torque provided by the spring.
- Under normal operating conditions, restraining torque is greater than the driving torque produced by the relay coil current.
- Therefore, the aluminium disc remains stationary.
- However, if the current in the protected circuit exceeds the pre-set value, the driving torque becomes greater than the restraining torque.
- Consequently, the disc rotates and the moving contact bridges the fixed contacts when the disc has rotated through a pre-set angle.
- The trip circuit operates the circuit breaker which isolates the faulty section.

Assessment

Overcurrent relays operate on the principle of:

A. Change in voltage

B. Rate of change of current

C. Magnitude of current exceeding a preset threshold.

D. Impedance measurement

References

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2. Paithankar Y G, Bhide S R, “Fundamentals of Power System Protection”, Prentice Hall of India Pvt Ltd., New Delhi, 2nd Edition, 2014.

3. Badriram, Vishwakarma B.H, “Power System Protection and Switchgear”, New Age International Pvt Ltd Publishers, 2nd Edition 2017.

Thank You