SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE NAME : 19EE605 PROTECTION AND SWITCHGEAR

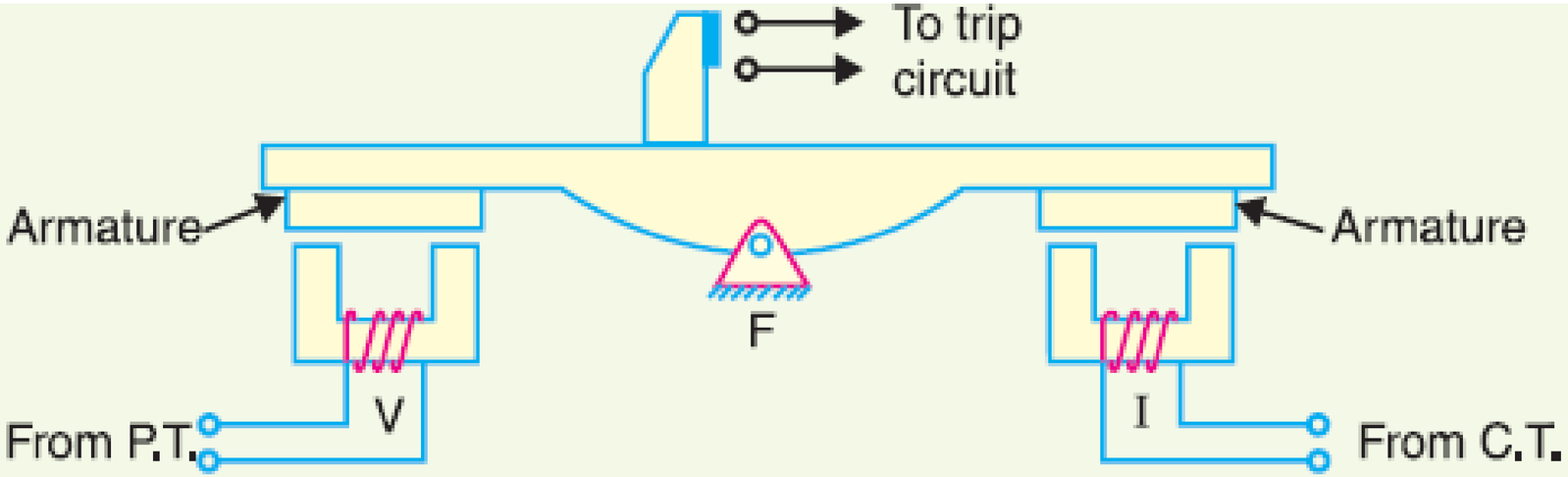
III YEAR /VI SEMESTER

Unit 2- ELECTROMAGNETIC RELAY

Topic: Definite – Distance Type Impedance Relay

Definite – Distance Type Impedance Relay

- It consists of a pivoted beam *F* and two electromagnets energised respectively by a current and voltage transformer in the protected circuit.
- The armatures of the two electromagnets are mechanically coupled to the beam on the opposite sides of the fulcrum.
- The beam is provided with a bridging piece for the trip contacts.
- The relay is so designed that the torques produced by the two electromagnets are in the opposite direction.


To trip
circuit
Armature
Armature
F
V
I
From P.T.
From C.T.

Operation.

- Under normal operating conditions, the pull due to the voltage element is greater than that of the current element.
- Therefore, the relay contacts remain open.
- However, when a fault occurs in the protected zone, the applied voltage to the relay decreases whereas the current increases.
- The ratio of voltage to current (*i.e.* impedance) falls below the pre-determined value.
- Therefore, the pull of the current element will exceed that due to the voltage element and this causes the beam to tilt in a direction to close the trip contacts.

Assessment

Distance relays measure:

A. Impedance of the protected line.

B. Voltage at different points along the line

C. Current flowing through the line

D. Power factor of the line

References

1. SuniS Rao, “Switchgear, Protection and Power System (Theory, Practice & Solved Problems)”, Khanna Publishers, New Delhi, 2019.

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