20th dec

megger

measure garne

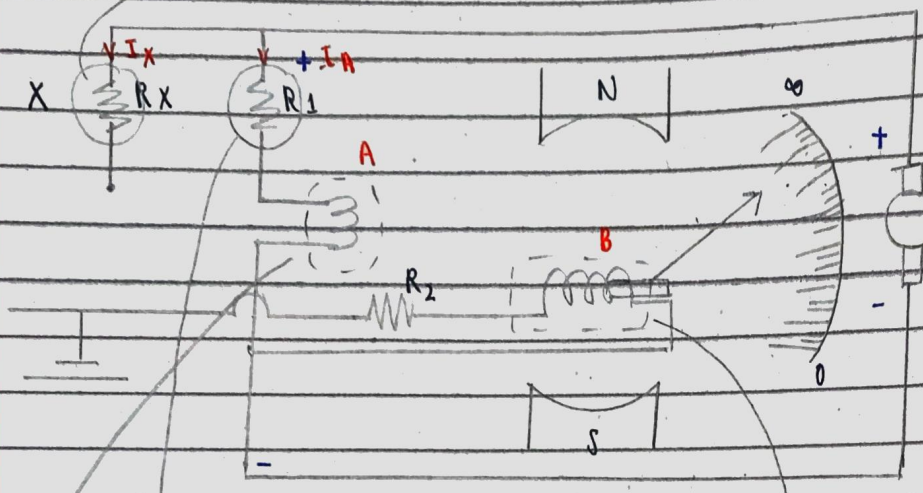


Fig: ckt diagram of megger

voltage coil

High resistance measurement

current coil

limiting resistance

- note:

Theory mo

- Inductance measure garne
- capacitance asked

2 qn — 1st chap-14
2nd chap-16
2 theory
2 num — 6 marks

Date
Page

measurement of Resistance

- low
  - Ammeter
  - voltmeter
- medium
  - wheatstone
    - asked most !!
- High
  - meggar

for num also

imp imp

chap: 3

Transducer:

↳ mechanical energy → converted to → electrical energy

& vice versa.

• on the basis of power supply

① Active

↳ doesn't need external power

·Eg: solar panel
tachogenerator
↓
moving parts no
speed measure
garna power generate garxa

② Passive

↳ needs external power supply to run

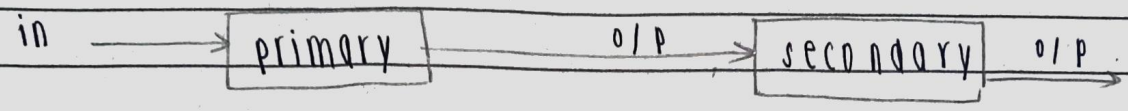
· Eg: Resistor
Inductor

• As a primary & secondary

① primary

↳ one form quantity → to → other form

(iii) secondary

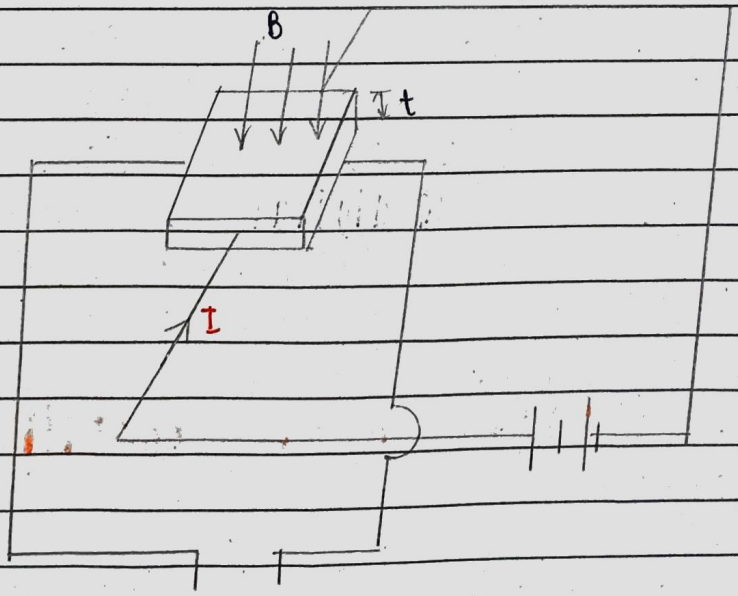


Eg:

Bourden Tube & LVDT for measurement of pressure

primary secondary

HALL effect



$$V_H = \frac{K_H B I}{t}$$

K_H → Hall coeff.

t → thickness of slab

Electric slab ma

· transverse dirn

↓

continuous mag field

&

· current is supplied at its ends

then,

· from its sides.

↓

voltage is produced.

types

① analog transducer

② digital transducer.

Factors to consider when choosing a transducer

1. sensitivity
2. error
3. dynamic & static characteristic
4. Accuracy
5. power supply
6. qty to be measured

④ way of operation

Potentiometer (POT)

└ Resistive transducer

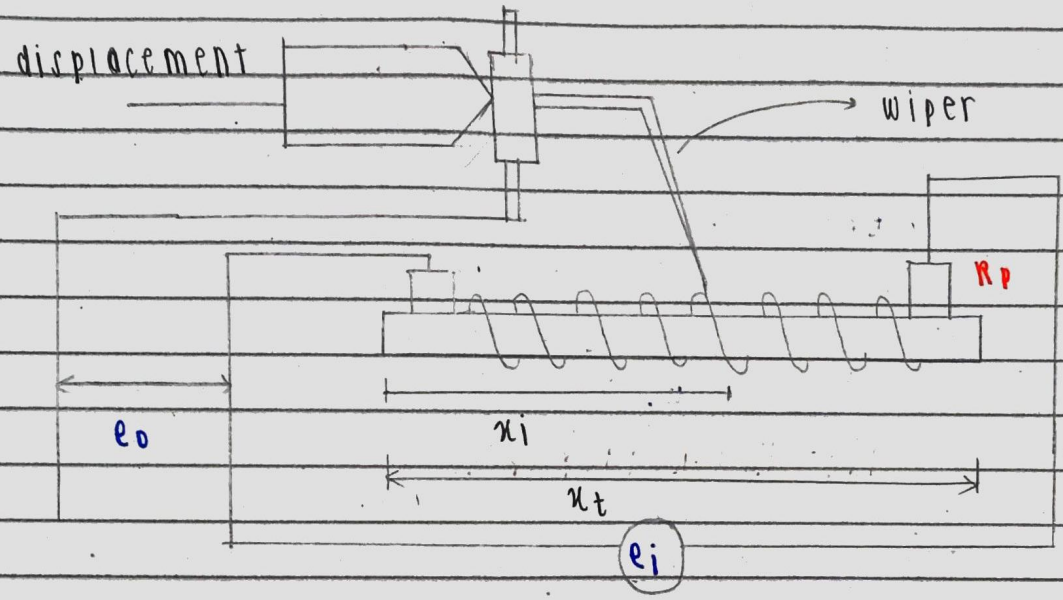


Fig: Linear POT (i)

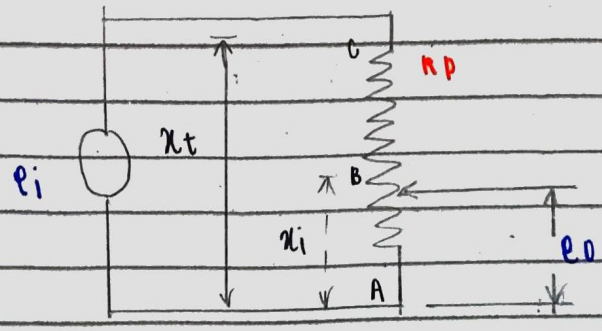


Fig: Electrical equivalent of above fig (ii)

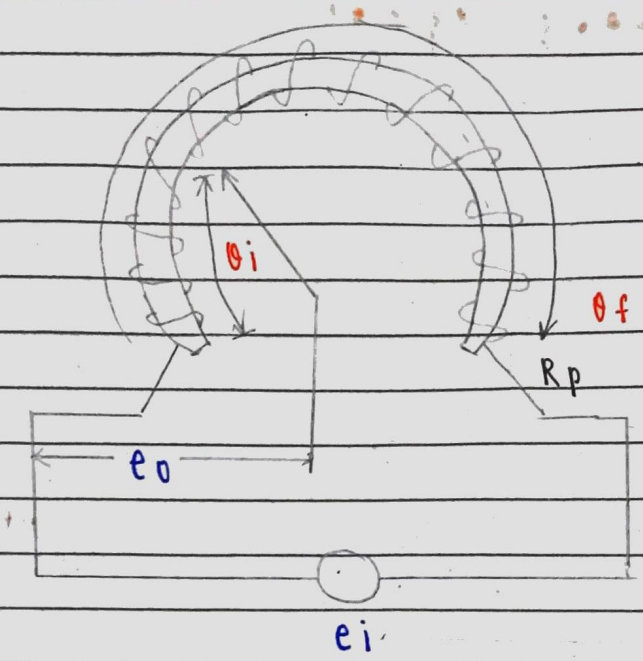


Fig (ii): Rotary POT

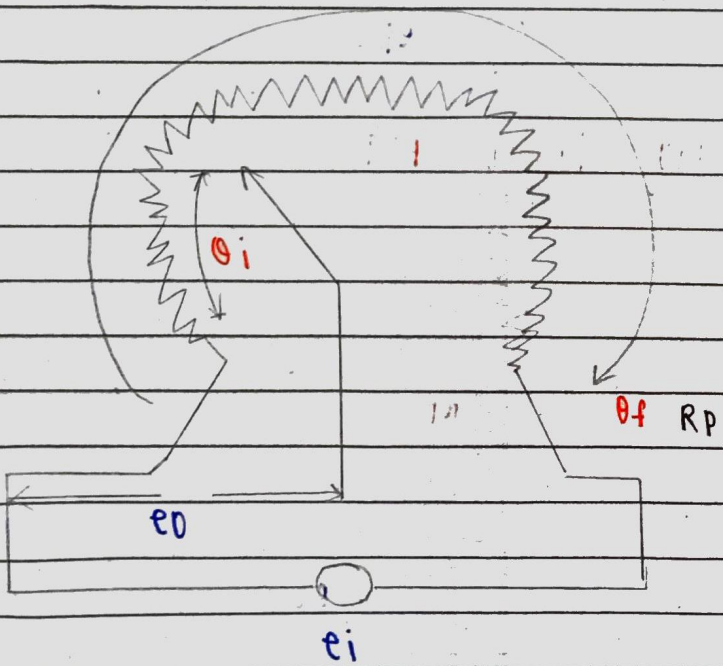


Fig: Electrical equivalent of fig (ii)
↓
(b)

Let 'xt' be total length of POT 'Rp' be the total resistance of POT

The R per unit length be $\frac{R_0}{x_t}$

'xi' be displacement of wiper from 0 position.
'eo' & 'ei' be o/p & i/p voltage respectively.

NOW,

from fig (a)

$\therefore$ Resistance $(R_{AB}) = x_i \times \frac{R_p}{x_t}$ ... (1)

Thus,

$R_{AB} = K R_p$

$0 \leq K \leq 1$

The total ideal o/p voltage due to displacement x_i

i.e. $e_0 = \left(\frac{R_{AB}}{R_{BC} + R_{AB}}\right) * e_i$

voltage divider rule

$$e_0 = \frac{K R_p}{R_p} * e_i$$

$$\therefore e_0 = K e_i \longrightarrow (i)$$

$$e_0 = \frac{x_i}{x_t} e_i \longrightarrow (ii)$$

$$\frac{e_0}{x_i} = \frac{e_i}{x_t} = \text{const.}$$