April
Thursday
08
99-267
WEEK 15

SEEBECK EFFECT (Thermoelectricity)

In 1822, Thomson Johann Seebeck discovered that an emf could be produced by thermal means alone, in a circuit composed of two different metals with their junctions at different temperatures. This effect is called Seebeck effect, after his name. The two metals constitute a thermocouple, the emf produced in a circuit is called thermo emf (thermoelectric motive force) or a Seebeck emf, and the current in the circuit due to this emf is known as thermo electric current.

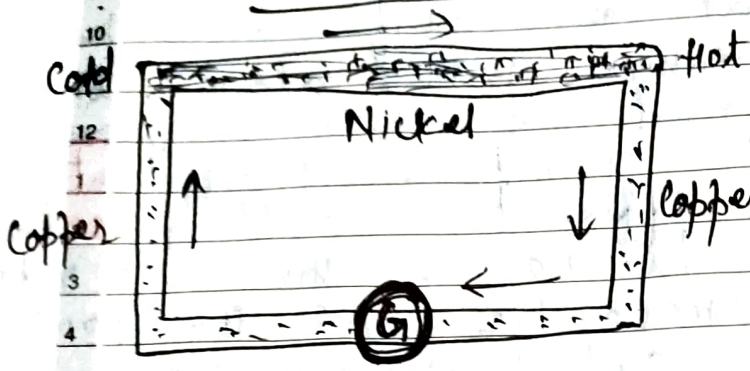
April
Friday
09
100-266
WEEK 15

Fig - 1

Figure 1 shows two metallic strips, made of different metals and joined at the ends to form a loop.

"When two wires of different metals are joined to form two junctions and kept at two different temperatures, an emf is set up. This is called Seebeck effect."

Neutral and Inversion Temperature.



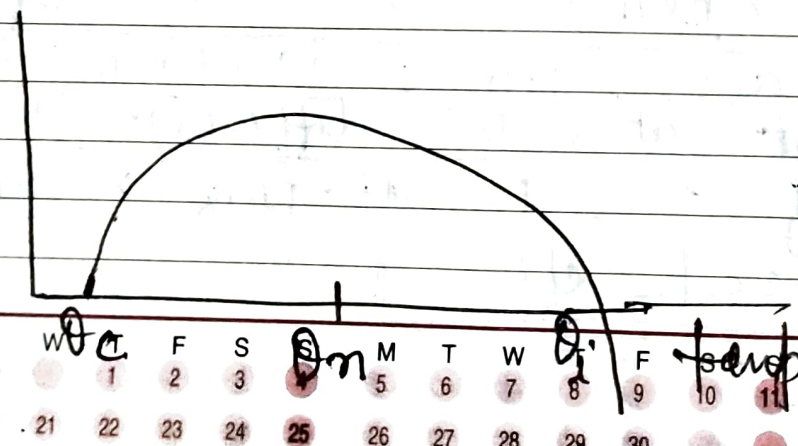
Copper-nickel thermocouple.

Evening

"The temperature of the hot junction at which the thermo-emf is maximum is called the neutral temperature and the temperature at which the thermo-emf changes its sign (current reverses) is called the inversion temperature."

If θ_c, θ_n and θ_i denote the temperature of the cold junction, the neutral temperature and the inversion temp. respectively, we have,

$$\theta_n - \theta_c = \theta_i - \theta_n \quad \text{---- (1)}$$



Evening