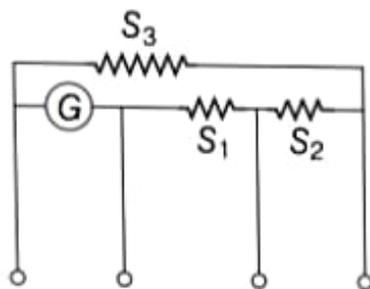


- Q. 28 A multirange current meter can be constructed by using a galvanometer circuit as shown in figure. We want a current meter that can measure 10mA, 100mA and 1mA using a galvanometer of resistance 10Ω and that produces maximum deflection for current of 1mA. Find S_1 , S_2 and S_3 that have to be used.



K Thinking Process

A galvanometer can be converted into ammeter by connecting a very low resistance wire (shunt S) connected in parallel with galvanometer. The relationship is given by $I_g G = (I - I_g) S$ where I_g is range of galvanometer, G is resistance of galvanometer.

Ans.

$$I_g \cdot G = (I_1 - I_g) (S_1 + S_2 + S_3) \text{ for } I_1 = 10 \text{ mA}$$

$$I_g (G + S_1) = (I_2 - I_g) (S_2 + S_3) \text{ for } I_2 = 100 \text{ mA}$$

$$I_g (G + S_1 + S_2) = (I_3 - I_g) (S_3) \text{ for } I_3 = 1 \text{ A}$$

and
gives
and

$$S_1 = 1 \text{ W}, S_2 = 0.1 \text{ W}$$

$$S_3 = 0.01 \text{ W}$$