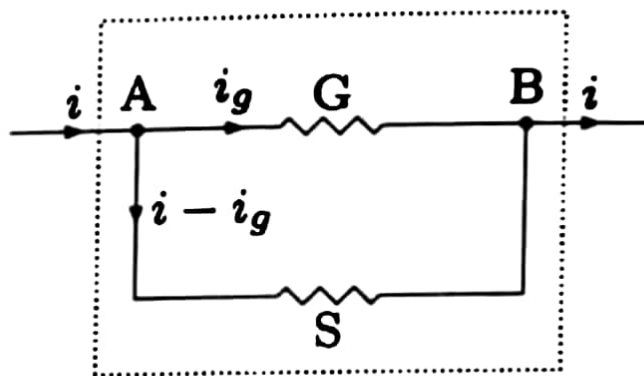


Q. 10 A moving coil galvanometer of resistance 100Ω is used as an ammeter using a resistance 0.1Ω . The maximum deflection current in the galvanometer is $100 \mu\text{A}$. Find the current in the circuit, so that the ammeter shows maximum deflection. (2005)

- (A) 100.1 mA (B) 1000.1 mA
 (C) 10.01 mA (D) 1.01 mA

Sol. A galvanometer of resistance G is converted to an ammeter by connecting a small shunt resistance S in parallel.



Kirchhoff's loop law gives

$$i_g G - (i - i_g)S = 0, \quad \implies \quad i = i_g(G + S)/S.$$

The maximum deflection current of galvanometer sets upper limit on the current measured by this ammeter. Substitute the values to get

$$\begin{aligned}
 i &= i_g(G + S)/S = (100 \times 10^{-6}) ((100 + 0.1)/0.1) \\
 &= 100.1 \text{ mA}.
 \end{aligned}$$

Ans. A \square