

**SUVA SANGAM COLLEGE**

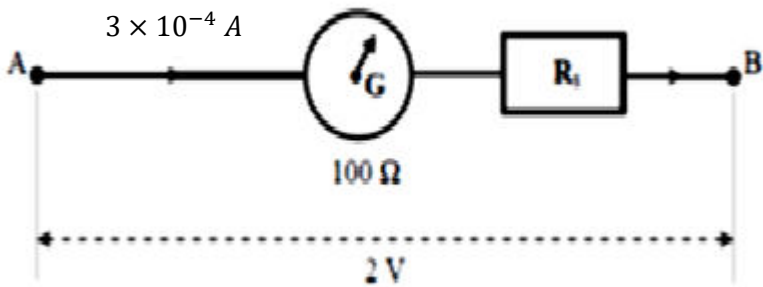
**YEAR 13**

**PHYSICS**

**WORKSHEET 11**

Strand 5 -P13.5	Direct Current
Reference from Text	Pg 88 to 137

**Questions**

No.	<b>CONCEPT IN BRIEF: Current density:</b> If a current is uniformly distributed over a cross-sectional area $A$ , the <i>current density</i> ( $J$ ) is given by $J = \frac{I}{A}$ , $J = nev$
1.	A metal wire of cross sectional area $4 \text{ mm}^2$ carries a current of 5 A and has $6 \times 10^{28}$ free electrons per cubic metre.  a) Calculate its current density  b) Calculate the drift velocity of the electrons
	<b>CONCEPT IN BRIEF:</b> To convert a Galvanometer into Voltmeter, a very high resistance known as “shunt” resistor is connected in series to Galvanometer.
2.	A galvanometer with resistance $100 \Omega$ has a full scale deflection (fsd) when $3 \times 10^{-4} \text{ A}$ is passed through it.    Calculate the:  a) potential drop across the galvanometer.  b) potential drop across $R_s$ .  c) value of $R_s$

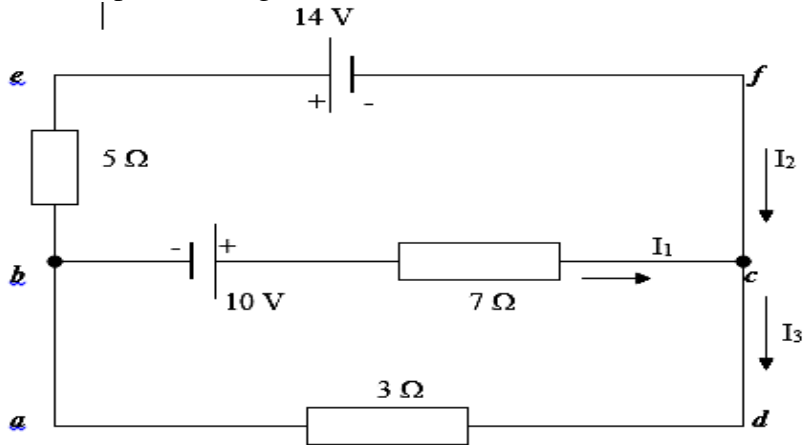
**CONCEPT IN BRIEF:** Kirchhoff's Rule 1. ( The junction rule ) (for current)

$$\sum I_{entering} = \sum I_{leaving}$$

Kirchhoff's rule 2. ( The loop rule ) (for voltage)

$$\sum V = 0$$

3. A multi-loop circuit is given below.



(a) Use Kirchhoff's first law, write an equation for junction c.

(b) Using Kirchhoff's second law, write equation for the loops: