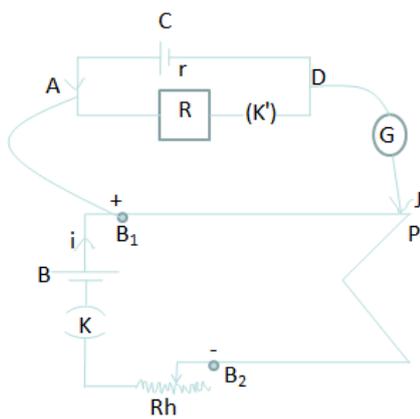




**Q3.** A resistance  $R$  is connected across a cell of emf  $\epsilon$  and internal resistance  $r$ . A potentiometer now measures the potential difference between the terminals of the cell as  $V$ . Write the expression for ' $r$ ' in terms of  $\epsilon$ ,  $V$  and  $R$ .

Answer:  $r = \frac{R(I_1 - I_2)}{I_2}$

[Please note to answer above question in examination you can directly write above expression but you must know actual how experiment is performed to find internal resistance using potentiometer.]



1. Key  $K'$  is kept open no current flows through  $R$  i.e. The circuit of the test cell is an open circuit. The balance point is found by using the test cell  $C$ .

The emf of the test cell  $E = i_1 r_1 \rightarrow (1)$

2. The Key  $K'$  is closed a current flows through the circuit of the test cell producing a potential difference across  $AD$

$$V = IR = \left( \frac{E}{R+r} \right) R \rightarrow (2)$$

Using the potential difference the balance point is found

$$V = i_2 r_2 \rightarrow (3)$$

Dividing equation (1) by equation (3)

$$\frac{E}{V} = \frac{i_1 r_1}{i_2 r_2} = \frac{I_1}{I_2}$$

$$\frac{E}{\left( \frac{E}{R+r} \right) R} = \frac{I_1}{I_2}$$

$$r = \frac{R(I_1 - I_2)}{I_2}$$

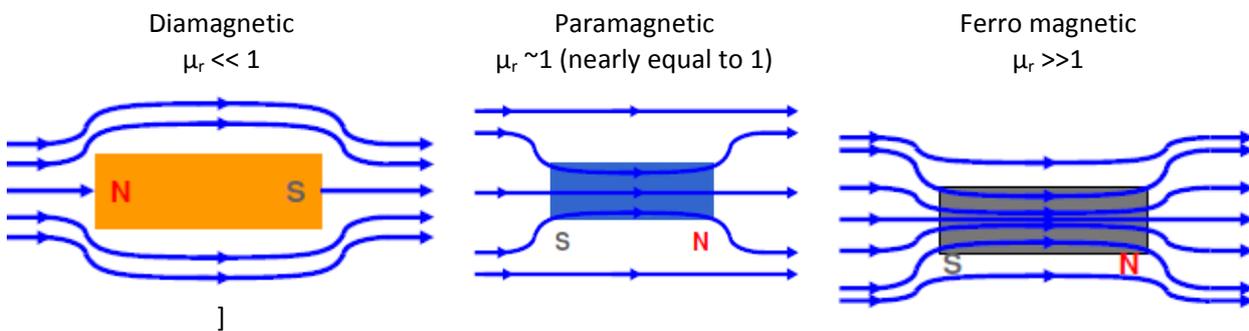
]



**Q4.**The permeability of magnetic material is 0.9983. Name the type of magnetic materials it represents.

**Answer:** Here given permeability 0.9983 (nearly equal to 1) hence magnetic material is Paramagnetic.

[You must know permeability is degree of allowance given by material to be passage of lines of force



**Q5.Repeate question**

**Q6.**In a transistor, doping level in base is increased slightly. How will it affect (I) collector current and (II) base current?

**Answer:** We know that the collector current is approximately beta ( $\beta$ ) times the base current.

- (i) Collector current will decrease
- (ii) Base Current will increase

**Q7.**Define the term 'watt less current'.

**Answer:** If the resistance offered by circuit is zero then the power dissipation is also zero such current does not perform any work. The component of current which does not contribute to the average power dissipation is called wattless current

**Q8.**When monochromatic light travels from one medium to another its wavelength changes but frequency remains the same. Explain.

**Answer:** velocity = frequency x wavelength, since velocity changes while passing through medium either frequency must change or wavelength must change. Nature requires that the phase of an electromagnetic wave must remain continuous across a boundary. In order for the phase to be continuous for all time the frequency must be constant, hence only wavelength changes.