

- 4 (a) A circuit consists of four resistors, R_1 , R_2 , R_3 and R_4 of the same resistance R and two ammeters, A_1 and A_2 , as shown in Fig. 4.1.

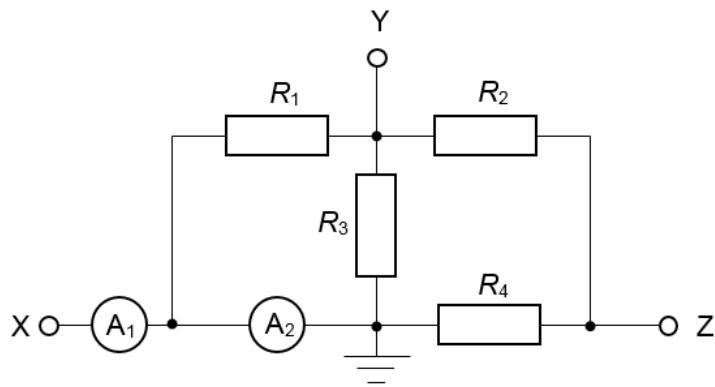


Fig. 4.1

The resistance measured between terminals X and Y is 2.4Ω .

Show that the value of resistance R is 6.0Ω .

[1]

- (b) A cell of e.m.f. 1.5 V and internal resistance 0.60Ω is connected across the terminals X and Y.

- (i) Calculate the current reading in ammeter A_1 .

current reading in A_1 = A [2]

- (ii) Calculate the current reading in ammeter A_2 .

current reading in A_2 = A [3]

- (iii) The positive terminal of the cell is connected to X.

Determine the electric potential at terminal Z.

electric potential at Z = V [2]

- (iv) An additional circuit consisting of a similar cell of e.m.f 1.5 V and internal resistance 0.60Ω , a resistor S and a sensitive galvanometer G, as shown in Fig. 4.2 , is now connected to the terminals X and Z.

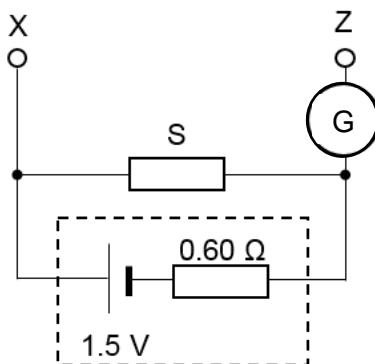


Fig. 4.2

The reading on galvanometer G is zero.

Determine the resistance of S.

resistance of S = Ω [2]