4 A circuit consists of three resistors R_1, R_2 and R_3, and two switches A and B, as shown in Fig. 4.1.

For Examiner's Use

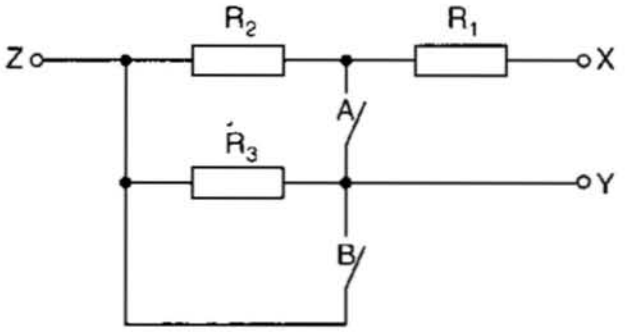

Fig. 4.1

The resistance between terminals X and Y is measured for different settings of the switches A and B. The results are shown in Fig. 4.2.

switch A	switch B	resistance between X and Y /Ω
open	open	12
open	closed	10
closed	open	6
closed	closed	6

Fig. 4.2

(a) Determine the resistance of

(i) resistor R_1,

resistance = ... Ω [1]

(ii) resistor R_2,

resistance = ... Ω [1]

(iii) resistor R_3.

resistance = ... Ω [1]

(b) Switch A is now closed and switch B is open.

Calculate the resistance between terminals X and Z.

resistance = ... Ω [2]