5 **(a)** Explain what is meant by the *potential difference* across an electrical component.

……

……

……

…...……[2]

(b) Fig. 5.1 shows the voltage-current variation of two components X and Y.

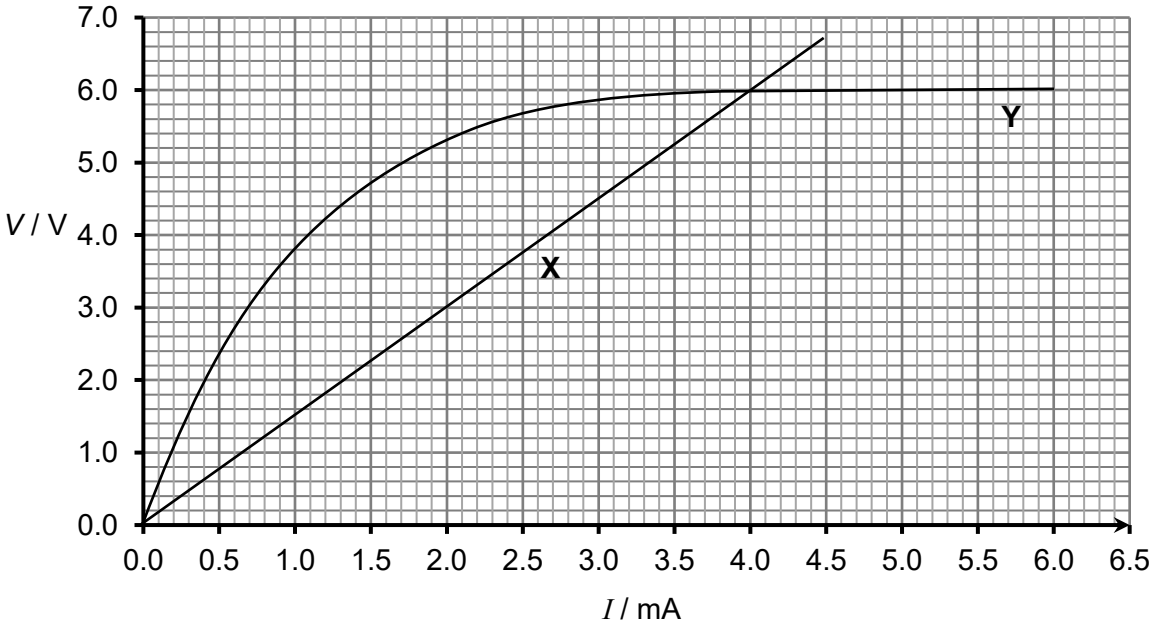

Fig. 5.1

State the maximum and minimum resistance of component Y between $V = 0.0$ V and $V = 6.0$ V .

minimum resistance = …… kΩ

maximum resistance = …… kΩ

[2]

(c) Components X and Y are connected in parallel as shown in Fig. 5.2. The parallel combination is connected in series with a variable resistor *R* and a cell of e.m.f. 8.0 V and negligible internal resistance.

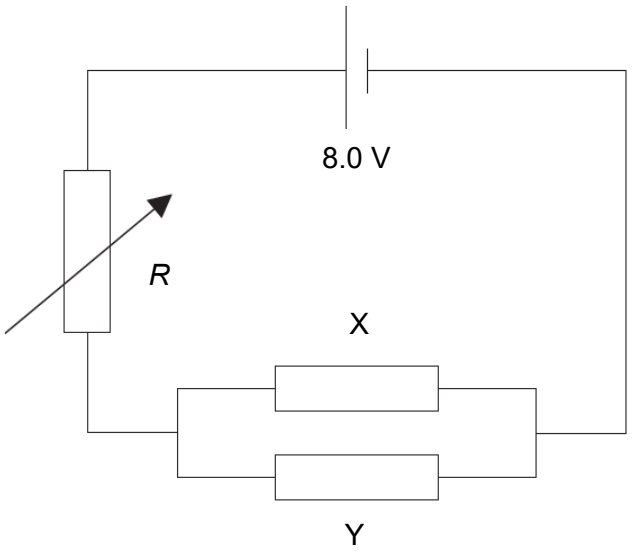

Fig. 5.2

(i) The resistance of the variable resistor *R* is adjusted until both X and Y are operating at the same resistance. With reference to Fig. 5.1, deduce the voltage across X and Y.

voltage = ……..…… V [1]

(ii) Hence, determine the resistance of the variable resistor *R*.

R = ... Ω [2]