Section B

Answer **all** the questions in the spaces provided.

9 A battery of e.m.f. 6.0 V and negligible internal resistance is connected to three resistors, each of resistance 2.0 kΩ, and a thermistor, as shown in Fig. 9.1.

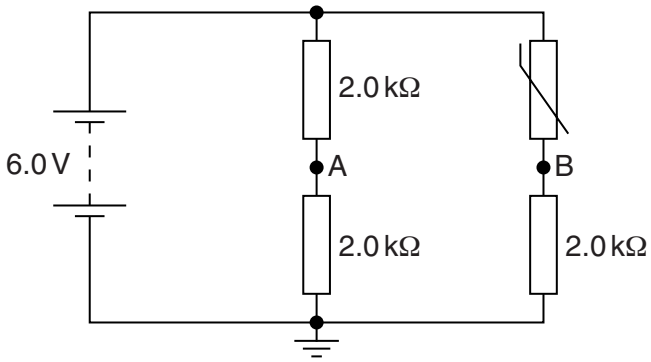

Fig. 9.1

The thermistor has resistance 2.8 kΩ at 10 °C and resistance 1.8 kΩ at 20 °C.

(a) Calculate the potential

(i) at point A,

potential = ... V [1]

(ii) at point B for the thermistor at 10 °C,

potential = ... V [2]

(iii) at point B for the thermistor at 20 °C.

potential = ... V [1]

(b) The points A and B in Fig. 9.1 are connected to the inputs of an ideal operational amplifier (op-amp), as shown in Fig. 9.2.

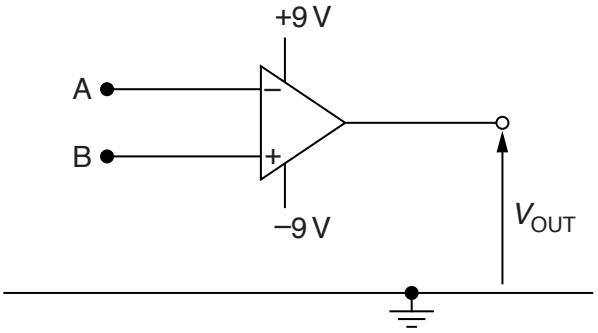

Fig. 9.2

The thermistor is warmed from 10 °C to 20 °C.

State and explain the change in the output potential V_{OUT} of the op-amp as the thermistor is warmed.

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.....[4]