Practice Question Set For A-Level
Subject : Physics
Paper-1 Topic: Electricity

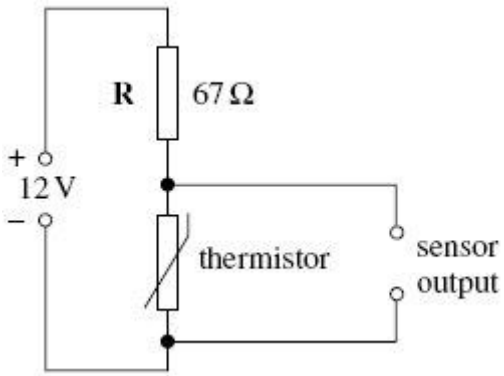
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Name of the Student:_____
Max. Marks : 17 Marks **Time :** 17 **Minutes**

Q1.

Figure 1 shows a circuit that can be used to sense temperature changes. Sensing is possible because the potential difference across the thermistor changes as the temperature changes.

Figure 1



The power supply has a negligible internal resistance and the resistor **R** has a resistance of 67 Ω.

(a) When the thermistor is at a high temperature the potential difference across it is 4.5 V.

(i) Calculate the potential difference across **R**.

_____

_____

potential difference _____ V

(1)

(ii) Calculate the current in the circuit.

_____

_____

_____

current _____ A

(2)

(b) (i) The temperature of the thermistor changes to 25 °C and its resistance becomes 360 Ω. Show that the potential difference across the thermistor at 25 °C is about 10 V.

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_____

(3)

(ii) Calculate the power dissipated in the resistor **R** when the thermistor temperature is 25 °C, giving an appropriate unit for your answer.

_____

_____

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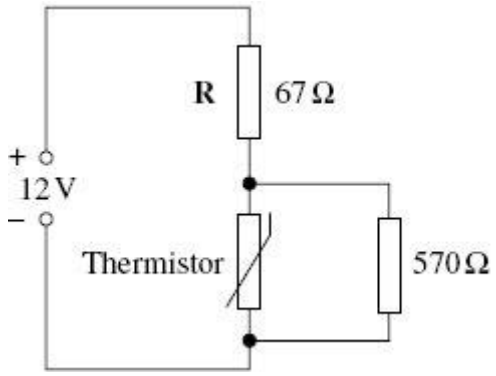
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power dissipated _____

(4)

(c) The circuit is modified as shown in **Figure 2**. A resistor of resistance 570 Ω is connected in parallel with the thermistor.

Figure 2



For the circuit in **Figure 2** calculate the current in the 67 Ω resistor when the thermistor temperature is 25 °C.

_____

_____

_____

_____

_____

current in 67 Ω resistor _____ A

(4)

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(d) Explain, in terms of charge carriers, why the resistance of the thermistor decreases as the temperature rises.

_____

_____

_____

_____

_____

_____

_____

(3)

(Total 17 marks)

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