1. A current of 56 μA flows in a wire for two minutes. Calculate th
given point in that time.

2. In pure water, fewer than 1 in 5 000 000 [illegible] exist as ions. T
molecules. Explain why pure water should behave as an insulato

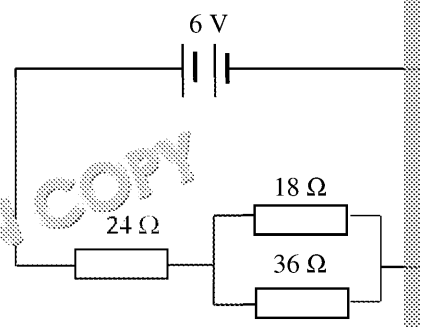
3. Dis[illegible] a piece of copper wire would be expected to beh
[illegible] in liquid helium. Liquid helium has a temperature of 4 K

4. (a) A 1.65 m long piece of constantan wire has a resistivity of 4.
of 1.20 Ω. Calculate the diameter of this wire.
(b) A student carried out an investigation to find the resistivity o
material. The results are shown in the table.

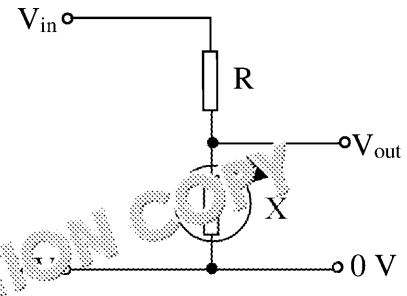
length of wire / m	mean resistanc
0.20	0.56
0.40	1.30
0.60	1.81
0.80	2.54
1.00	3.18
[illegible]	3.68
[illegible]	4.21
1.60	4.92

(i) Plot a graph of these results and draw a straight line of b
horizontal axis.
(ii) The wire had a cross-sectional area of 2.1×10^{-7} m^2. Us
graph to determine the resistivity of this wire.

5. The diagram shows a circuit containing three resistors.
Calculate the current through the battery. Assume the battery has

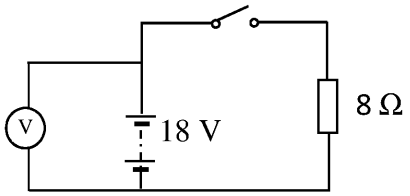


6. The circuit diagram shows part of a sensor in a house.



V_{in} is constant at 120 V. At a particular light intensity the ratio of R
(a) Calculate V_{out} when the ratio of R : X is 1 : 3.
(b) Explain what happens to this ratio as the light intensity decreas

7. The circuit below can be used to determine the internal resistance o



The battery in the circuit has an e.m.f. of 18 V.
When the switch is closed, the voltmeter read 5 V.
Calculate the internal resistance of the batter

Preview of Questions Ends Here