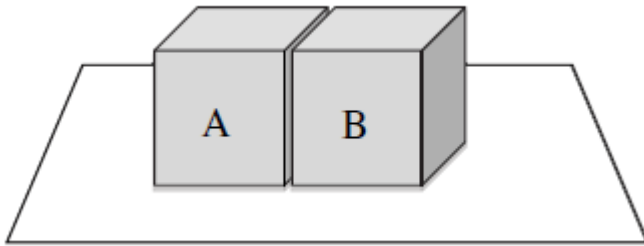


Name.....

Revision

Question 1 Thermal Physics

Two metal blocks which have the same mass of 2kg are placed in contact with each other. Block A is made of copper and Block B is made of an unknown metal.



Copper has a specific heat capacity of $385 \text{ J K}^{-1} \text{ kg}^{-1}$

The copper block has a starting temperature of 550 K and the unknown block has a starting temperature of 300K.

After 3 minutes the blocks reach thermal equilibrium and are both at a temperature of 150°C .

a) Calculate the power transfer between the blocks at during this time.

b) What is the specific heat capacity of the unknown block?

Question 2 Electricity

Julie has 16 ceiling lights in her living room. Each light is rated 40 W and requires 36 V to work properly. Julie has the lights on for 3 hours per day on average.

a. Calculate the current through each light bulb.

2 marks

- b. When all lights are on, how much combined charge would move through the 16 lights in 1 second? 2 marks

Julie has decided that she wants to reduce her power usage by installing energy-efficient light bulbs that use only 10 W, but still work at 36 V.

- c. How much energy, in kWh, will Julie save per day if she uses the new light bulbs? 3 marks

Question 3 Matter

- (a) Why was it not possible for atoms to form in the early universe?
- (b) Which is the main force that:
- (i) holds protons and neutrons together?
 - (ii) holds electrons in orbit?
- (c) Which of the forces in (b) are strongest?
- (d) What is the name of the gauge boson associated with the forces in (b)