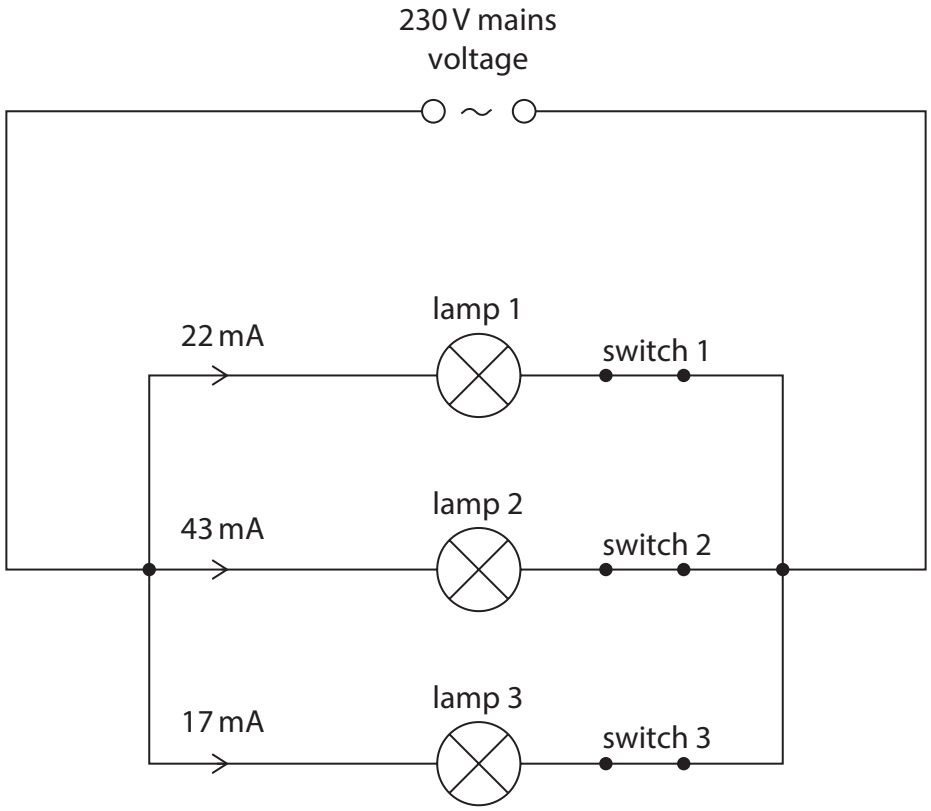
7 The diagram shows a domestic lighting circuit.



(a) Explain an advantage of using this circuit for domestic lighting.

(2)

(b) When switch 1 is closed, the current in lamp 1 is 22 mA.

(i) Give the name of the charged particle that moves in an electric current.

(1)

(ii) Show that lamp 1 has a power of about 5 W.

(3)

(iii) Calculate the energy transferred by lamp 1 when it is on for 30 seconds.

(3)

energy transferred = ... J

(c) The circuit is connected to the mains supply. Mains voltage is 230 V.

(i) State what is meant by the term **voltage**.

(1)

.....

.....

(ii) Switches 1 and 3 are closed, which turn on lamps 1 and 3.

Switch 2 is open.

Calculate the current in the mains supply.

(2)

current = ... mA

(Total for Question 7 = 12 marks)