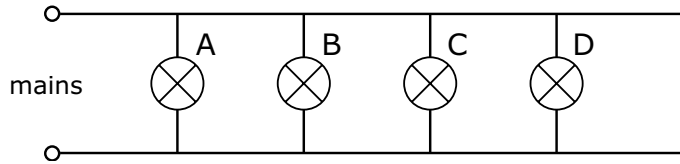


## Circuits 2

**Name & Set**

- 1 Ceiling lights in the home are always wired in parallel as shown in the diagram.



- (a) What is the advantage, if any, of wiring lamps in parallel?

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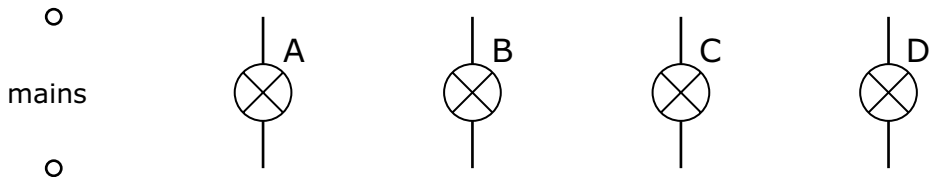
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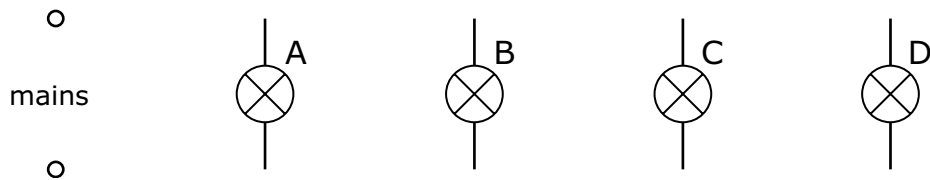
- (b) Complete the diagram below to show where you would place a switch to turn all the lamps on or off at the same time. [3]

[2]



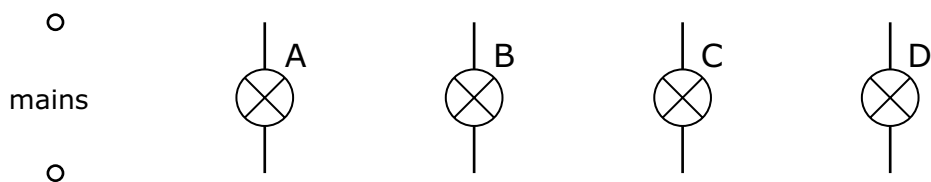
- (c) Complete the diagram below to show where you would place switches to turn each lamp on and off independently of all the others? [2]

[2]



- (d) Complete the diagram below to show how you could turn off lamps C & D from the same switch? [2]

[2]



2 Figure 1 shows one way in which overhead lighting can be installed over a kitchen worktop. The lighting system consists of three low-voltage lamps suspended between two parallel wires AB & CD attached to the walls of the room. The lamps are free to slide along the wires to any desired position over the worktop. The wires are connected to the mains supply at X and Y via a step-down transformer that reduces the mains voltage from 230 V to 12 V.

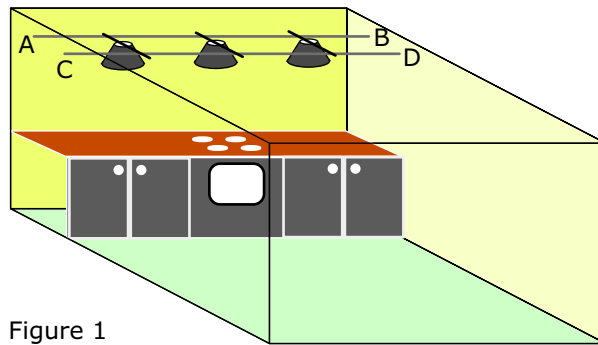


Figure 1

Figure 2 shows the lighting arrangement in greater detail.

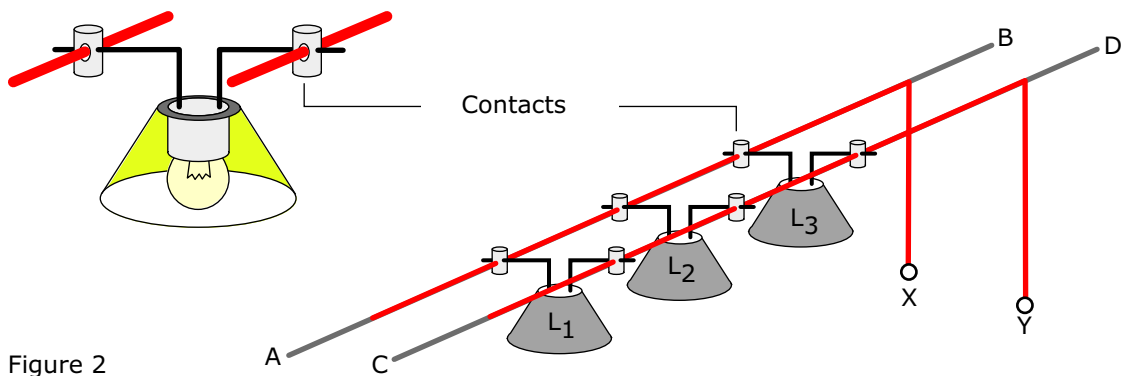


Figure 2

Each lamp is rated at 12 V

- (a) Are the lamps wired in series or in parallel? \_\_\_\_\_ [1]  
 (b) In the space below draw a circuit diagram for this arrangement. Show the position of the switch used to turn the lamps on and off. [2]



- (c) There is no insulation on the wires horizontal wires AB & CD. Is this done to save money or is there another reason why the wires are left bare?

\_\_\_\_\_  
 \_\_\_\_\_ [2]

- (d) Why are the lamps low voltage? Is this done to save energy, or is there another reason for running them at a fraction of mains voltage?

\_\_\_\_\_  
 \_\_\_\_\_ [2]