

Series and parallel circuit patterns

Grade 7 science (Year 8 · Class 7) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test checks series and parallel circuits, switches, cells in series, short circuits and fuses. You have 45 minutes and 20 marks. Explain your reasoning with the idea of paths for the current, and give units for every voltage.

Level: Grade 7 science (Year 8 · Class 7) · **Curriculum:** MS-PS2-3

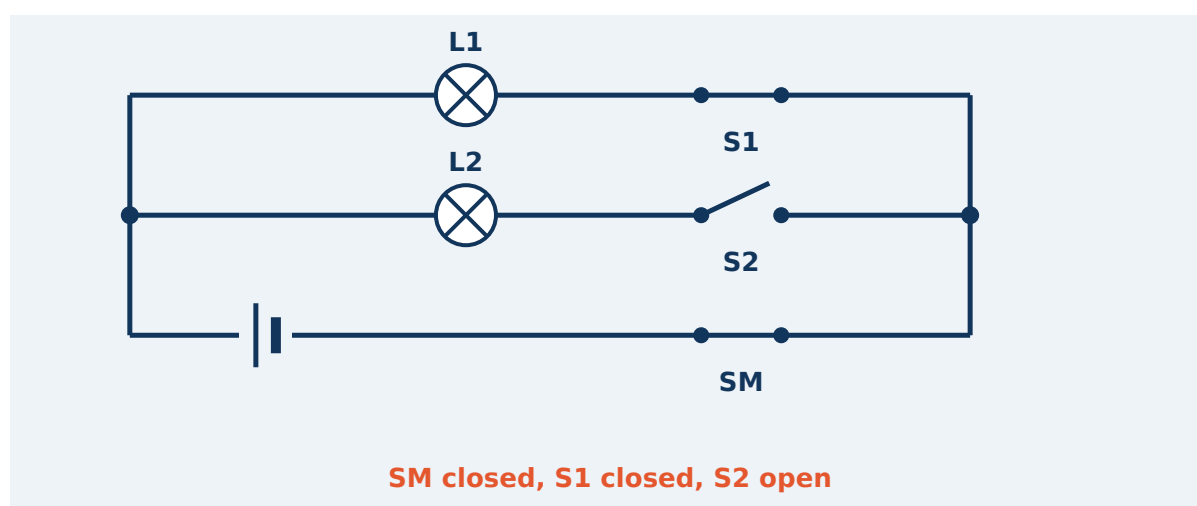
Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Define the circuits (3 marks)

- Describe a series circuit. (1 mark)
- Describe a parallel circuit. (1 mark)
- State which type is used for the lights in a house. (1 mark)

Question 2 Reading the circuit (4 marks)

The figure shows two lamps and three switches.



Lamps L1 and L2 with a master switch SM and branch switches S1 and S2.

- State which lamp is lit as drawn. (1 mark)
- State which lamps are lit if S2 is closed and SM is open. (1 mark)
- State what must be closed for both lamps to be lit. (1 mark)
- Explain why L1 stays lit when L2 is unscrewed. (1 mark)

Question 3 Cells (2 marks)

Each cell gives 1.5 V.

- Calculate the voltage of four cells in series. (1 mark)
- State the voltage of four cells in parallel. (1 mark)

Question 4 Brightness (3 marks)

Sara in Karachi has a bulb connected to a cell. She adds an identical second bulb.

- Predict the brightness if the bulb is added in series. (1 mark)
- Explain your prediction. (1 mark)
- Predict the brightness if the bulb is added in parallel. (1 mark)

Question 5 Short circuits (3 marks)

- Define a short circuit. (1 mark)
- Explain why a short circuit is dangerous. (1 mark)
- Explain how a fuse helps. (1 mark)

Question 6 String of lights (2 marks)

A string of 8 identical 1.5 V bulbs is connected in series to a supply.

- Calculate the supply voltage needed. (1 mark)
- Explain why all the bulbs go out if one is removed. (1 mark)

Question 7 Two lamps, three switches (2 marks)

Describe how to connect two lamps, a cell and switches so that each lamp can be turned off separately and a third switch turns off both. (2 marks)

Question 8 Why parallel in homes (1 mark)

State one advantage of wiring household appliances in parallel. (1 mark)