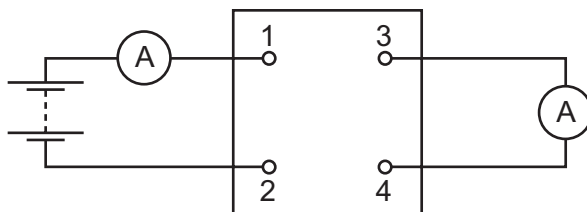
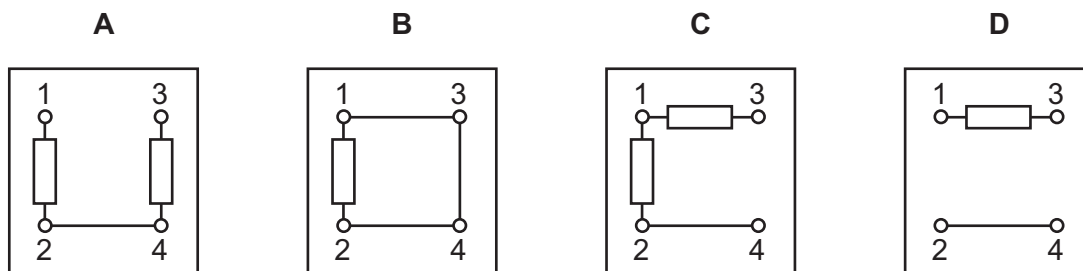


- 38 The diagram shows a four-terminal box connected to a battery and two ammeters.



The currents in the two meters are identical.

Which circuit, within the box, will give this result?



- 39 A material contains a radioactive isotope that disintegrates solely by the emission of α -particles at a rate of 100 s^{-1} .

Which statement about this material is correct?

- A** The number of atoms in the material diminishes at a rate of 100 s^{-1} .
B The number of neutrons in the material diminishes at a rate of 100 s^{-1} .
C The number of nucleons in the material diminishes at a rate of 400 s^{-1} .
D The number of protons in the material diminishes at a rate of 100 s^{-1} .
- 40 A radioactive nucleus emits an α -particle or a β -particle, creating a product nucleus.

Which decay process could create the product nucleus stated?

| | radioactive nucleus | decay | product nucleus |
|----------|------------------------|----------|------------------------|
| A | $^{226}_{88}\text{Ra}$ | α | $^{224}_{86}\text{Rn}$ |
| B | $^{238}_{92}\text{U}$ | α | $^{242}_{94}\text{Pu}$ |
| C | $^{228}_{88}\text{Ra}$ | β | $^{228}_{87}\text{Fr}$ |
| D | $^{231}_{90}\text{Th}$ | β | $^{231}_{91}\text{Pa}$ |