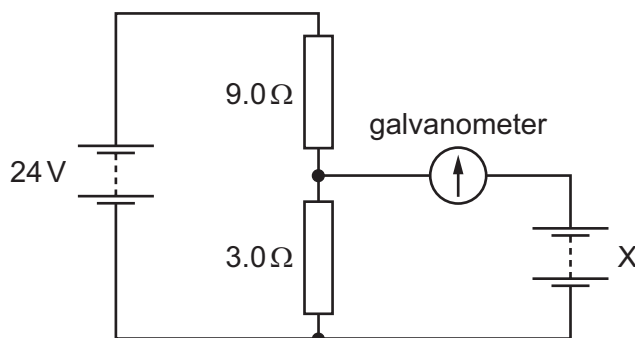


- 37 A circuit contains two batteries, each of negligible internal resistance, and two resistors as shown.



The galvanometer has a current reading of zero.

What is the electromotive force (e.m.f.) of battery X?

- A** 6.0V **B** 8.0V **C** 16.0V **D** 18.0V
- 38 A nucleus of francium-221 (${}_{87}^{221}\text{Fr}$) decays into a nucleus of bismuth-209 (${}_{83}^{209}\text{Bi}$) in several steps.

Which particles could be emitted?

- A** 2 α -particles and 4 β^- particles
B 2 α -particles and 4 β^+ particles
C 3 α -particles and 2 β^- particles
D 3 α -particles and 2 β^+ particles
- 39 Which equation describes the changes to the quark composition of a nucleus and the lepton emission during the process of β^+ decay?
- A** down \rightarrow up + positron + electron neutrino
B down \rightarrow up + positron + electron antineutrino
C up \rightarrow down + positron + electron neutrino
D up \rightarrow down + positron + electron antineutrino
- 40 There are protons, neutrons and electrons in the simple model of an atom.

To which class (group), hadron or lepton, do these particles belong?

	hadron	lepton
A	electron	proton and neutron
B	neutron	proton and electron
C	proton and electron	neutron
D	proton and neutron	electron







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