37 Hydrogen and deuterium can be represented by the nuclide symbols ${}^{1}_{1}\mathrm{H}$ and ${}^{2}_{1}\mathrm{H}$ respectively.

What is a difference between hydrogen and deuterium?

A The deuterium atom has twice the number of electrons as the hydrogen atom.

B The deuterium nucleus has a charge, but the hydrogen nucleus has no charge.

C The deuterium nucleus has less mass than the hydrogen nucleus.

D The deuterium nucleus has half the charge per unit mass of the hydrogen nucleus.

38 A radioactive sample decays by emitting β^- particles.

The energy released in the decay process is the same for each nucleus that decays, but the β^- particles emitted have a continuous range of kinetic energies.

Which statement explains why the β^- particles are emitted with a continuous range of kinetic energies?

A Some of the energy released is given to the remaining nucleons in the nucleus.

B Some of the energy released is taken by an emitted antineutrino.

C Some of the energy released is used to create the β^- particle.

D Some of the energy released is used to create a new nucleon.

39 Which particle is **not** a fundamental particle?

A electron

B neutrino

C neutron

D top quark

40 What is the charge of an anti-top quark?

A $-\frac{2}{3}e$ **B** $-\frac{1}{3}e$ **C** $+\frac{1}{3}e$ **D** $+\frac{2}{3}e$