

SECTION B

Answer ALL questions. Write your answers in the spaces provided.

11 (a) Pions belong to a group of particles known as mesons.

State the quark structure of mesons.

(1)

(b) Muons belong to a family of particles known as leptons.

State one property of leptons.

(1)

(c) Charged pions usually decay into a muon ( $\mu$ ) and another particle X, as shown by the decay equation:

$$\pi^- \rightarrow \mu^- + X$$

A student suggests that X is an anti-neutrino due to particle conservation laws.

Deduce whether the student is correct.

(4)