

- 39** Strontium- 90 ( $^{90}_{38}\text{Sr}$ ) is radioactive and emits  $\beta$ -particles.

Which equation could represent this nuclear decay?

- A**  $^{90}_{38}\text{Sr} \rightarrow ^{90}_{39}\text{Sr} + ^0_{-1}\beta$   
**B**  $^{90}_{38}\text{Sr} \rightarrow ^{90}_{39}\text{Y} + ^0_{-1}\beta$   
**C**  $^{90}_{38}\text{Sr} \rightarrow ^{90}_{37}\text{Rb} + ^0_1\beta$   
**D**  $^{90}_{38}\text{Sr} \rightarrow ^{90}_{37}\text{Sr} + ^0_1\beta$

- 40** Protons and neutrons are thought to consist of smaller particles called quarks.

The 'up' quark has a charge of  $\frac{2}{3}e$  : a 'down' quark has a charge of  $-\frac{1}{3}e$ , where  $e$  is the elementary charge ( $+1.6 \times 10^{-19}\text{C}$ ).

How many up quarks and down quarks must a proton contain?

	up quarks	down quarks
<b>A</b>	0	3
<b>B</b>	1	1
<b>C</b>	1	2
<b>D</b>	2	1