6 **(a)** State **one** difference between a hadron and a lepton.

.....

.....[1]

(b) A proton within a nucleus decays to form a neutron and two other particles. A partial equation to represent this decay is

$$^{1}_{1}p \rightarrow {}^{1}_{0}n + {}^{\cdots\cdots}_{\cdots\cdots} \cdots\cdots + {}^{\cdots\cdots}_{\cdots\cdots} \cdots\cdots$$

(i) Complete the equation. [2]

(ii) State the name of the interaction or force that gives rise to this decay.

.....[1]

(iii) State three quantities that are conserved in the decay.

1. .....

2. .....

3. .....

[3]

(c) the quark composition of a proton to show that it has a charge of $+e$, where e is the elementary charge.

Explain your working.

[3]

[Total: 10]