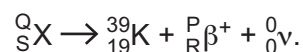


- 7 (a) A nucleus of an element X decays by emitting a  $\beta^+$  particle to produce a nucleus of potassium-39 ( ${}^{39}_{19}\text{K}$ ) and a neutrino. The decay is represented by



- (i) State the number represented by each of the following letters.

P .....

Q .....

R .....

S .....

[2]

- (ii) State the name of the interaction (force) that gives rise to  $\beta^+$  decay.

..... [1]

- (b) A hadron is composed of three identical quarks and has a charge of  $+2e$ , where  $e$  is the elementary charge.

Determine a possible type (flavour) of the quarks.

Explain your working.

.....

..... [2]

[Total: 5]