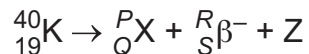


- 5 (a) Potassium-40 (${}^{40}_{19}\text{K}$) undergoes β^- decay to form a nuclide of element X. Particle Z is emitted during the decay. The equation for the decay is shown.



- (i) State the values of P , Q , R and S .

$P =$ $R =$

$Q =$ $S =$

[2]

- (ii) State the name of particle Z.

..... [1]

- (iii) State the name of the class of fundamental particle to which both the β^- particle and particle Z belong.

..... [1]

- (b) Determine the quark composition of an alpha-particle.

quark composition [3]

[Total: 7]