7 **(a)** Describe the structure of an **atom** of uranium-238, $^{238}_{92}U$.

.....

.....

..... [2]

(b) The decay of uranium-238 is shown by the equation

$$^{238}_{92}U \rightarrow {}^{234}_{90}Th + X.$$

For nucleus X, calculate the ratio, in $C\,kg^{-1}$, of

$$\frac{\text{charge}}{\text{mass}}.$$

ratio = ... $C\,kg^{-1}$ [3]

(c) Two particles P and Q each consist of three quarks. These quarks are up (u) or down (d) quarks.

Particle P has no overall charge.

Particle Q has an overall charge of +2*e*, where *e* is the elementary charge.

State the quark composition of:

(i) particle P

..... [1]

(ii) particle Q.

..... [1]

[Total: 7]