RADIOACTIVITY

MARKING SCHEME

1. a) It is the time taken by a given amount of a radioactive isotope to decay up to half of the
    original amount ✓ 1

b) No of decays ✓

$$\frac{100}{25} = 4$$

$$m \to 40 \to 29g \to 10g \to 5g \checkmark$$

$$Hence\ M = 40\ x\ 2 = 80g$$

2.

$$\frac{48}{384} = \frac{1}{8}$$

$$x \xrightarrow{t\,\frac{1}{2}} \frac{x}{2} \xrightarrow{t\,\frac{1}{2}} \frac{x}{4} \xrightarrow{t\,\frac{1}{2}} \frac{x}{8} \qquad\qquad (1mk)$$

$$3t\,\frac{1}{2} = 384\,days \qquad\qquad (1mk)$$

$$\therefore\ t\,\frac{1}{2} = \frac{384}{3}\ (1mk) = 128\ days\ (1mk)$$

3.(a) $\quad {}^{234}_{92}U \to {}^{230}_{90}Th + {}^{4}_{2}He$ ✓ 1/2
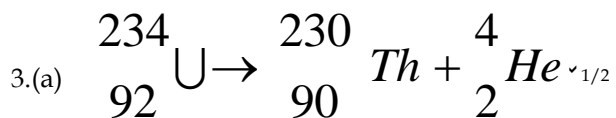
(b) – carbon dating

- In Agriculture to study the functioning of elements in the soil and fertilizer used in medicine for treatment of the thick of cancer; treatment of malignant growths.

- In controlling the thickness of paper, rubber, metal sheets, plastic and films, filling of packets and containers.

Any 2   1mk each