

Physics
Advanced
PAPER 2: Advanced Physics II

Thursday 6 June 2024 – Morning

Time: 1 hour 45 minutes

Diagram Booklet

THIS DIAGRAM BOOKLET MUST BE RETURNED WITH THE QUESTION PAPER AT THE END OF THE EXAMINATION.

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

INSTRUCTIONS

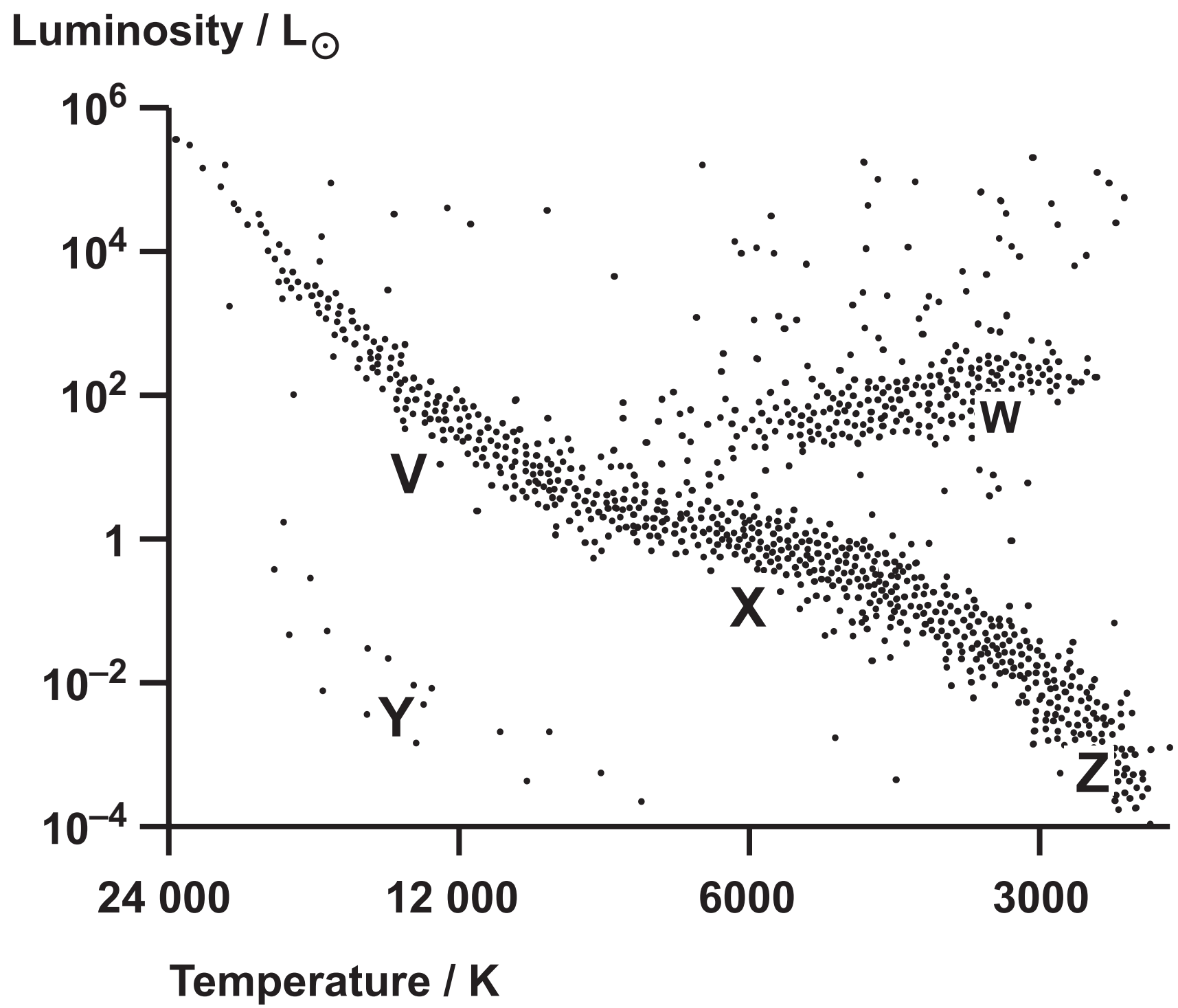
There may be spare copies of some diagrams in case you need them.

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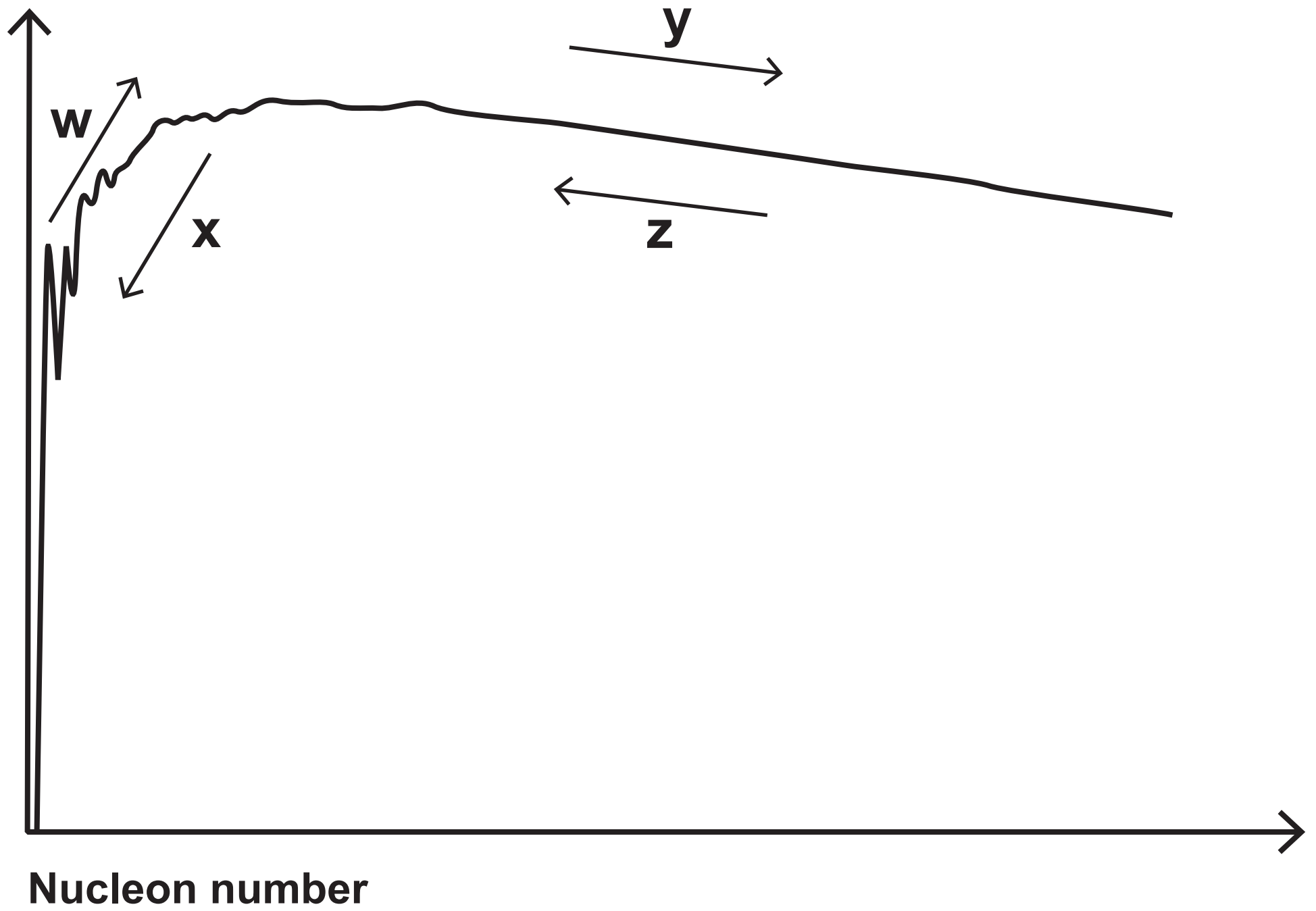
3	Question 1
4	Question 6
5	Question 7
6	Question 9
7	Question 15
8	Question 16
9	Question 17(a)
10	Question 18(b) – not to scale
11	Question 19(c)(ii)

Question 1

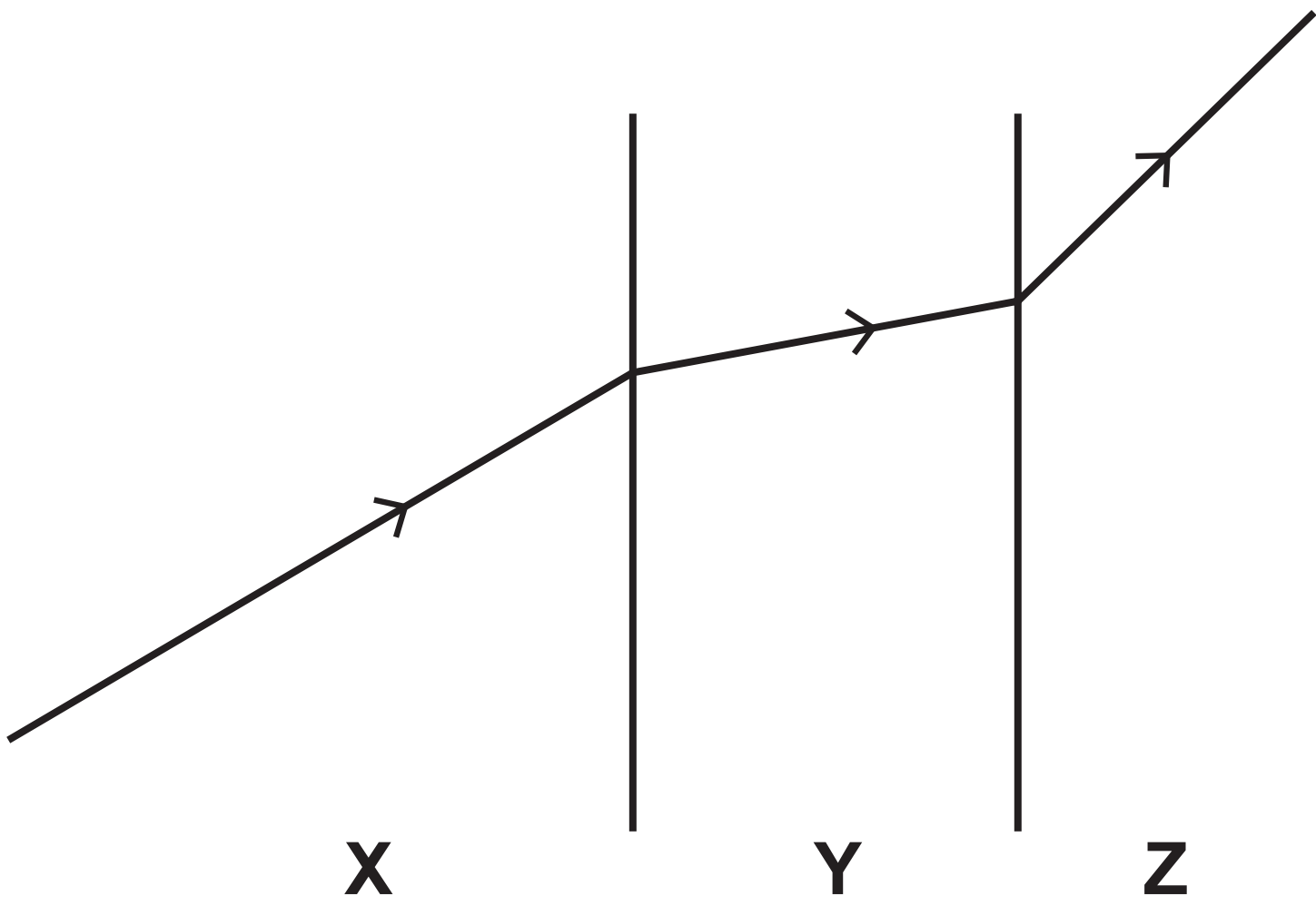


Question 6

Binding energy
per nucleon

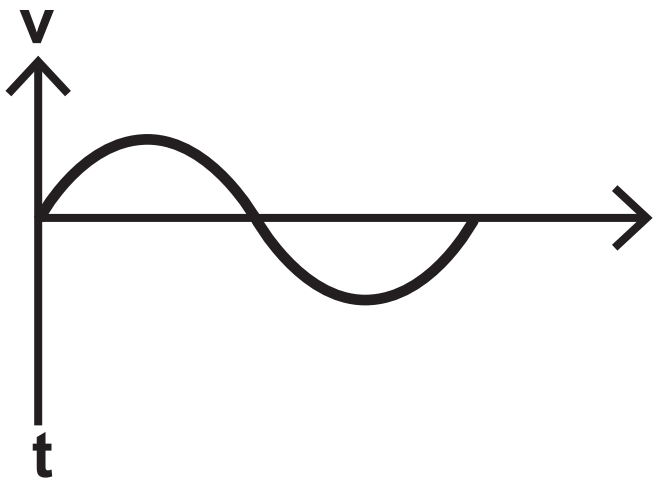


Question 7

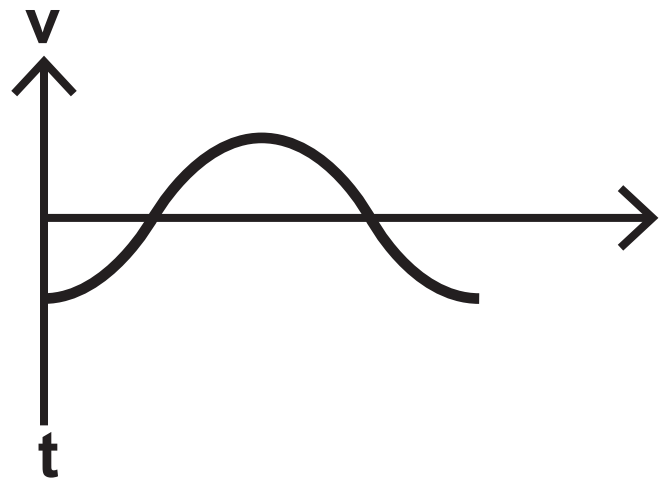


Question 9

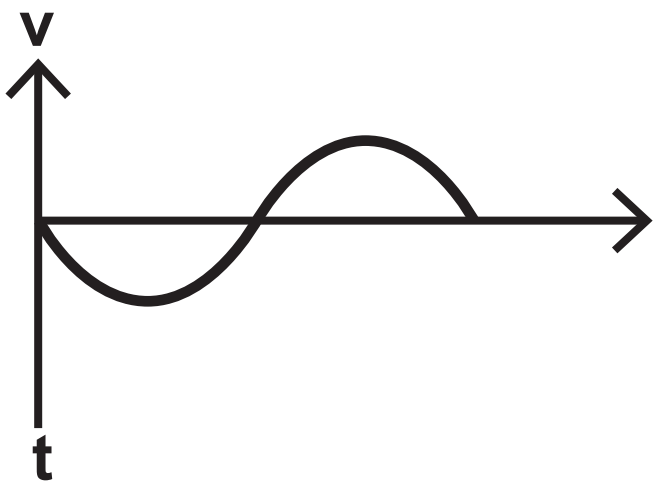
GRAPH A



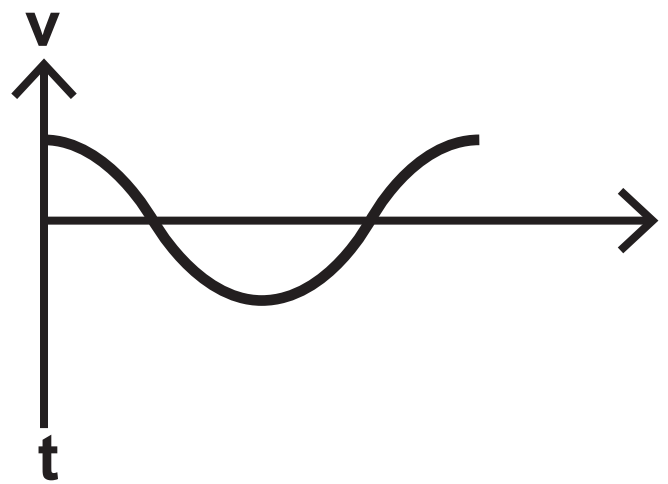
GRAPH B



GRAPH C



GRAPH D



Question 15

DIAGRAM 1

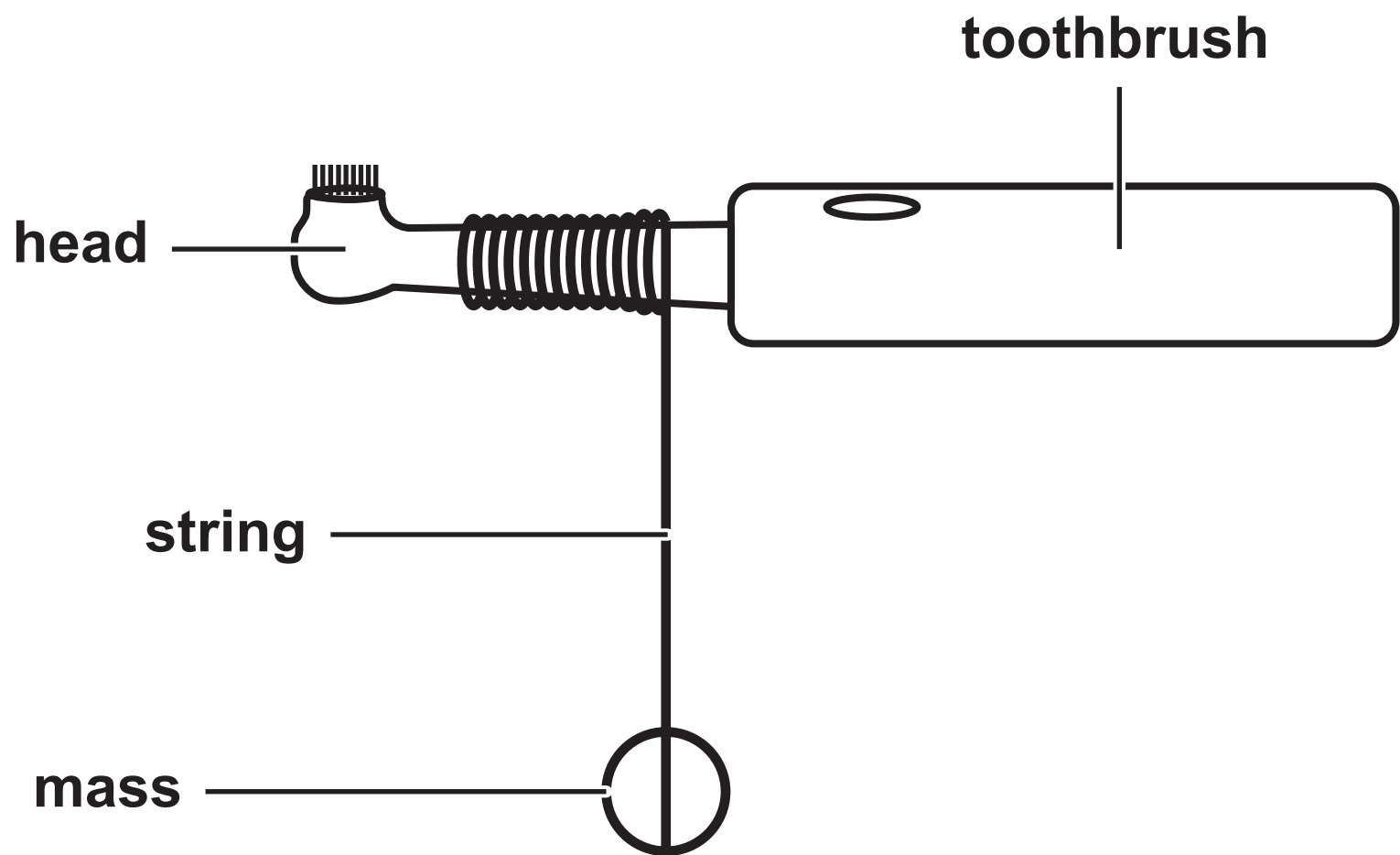
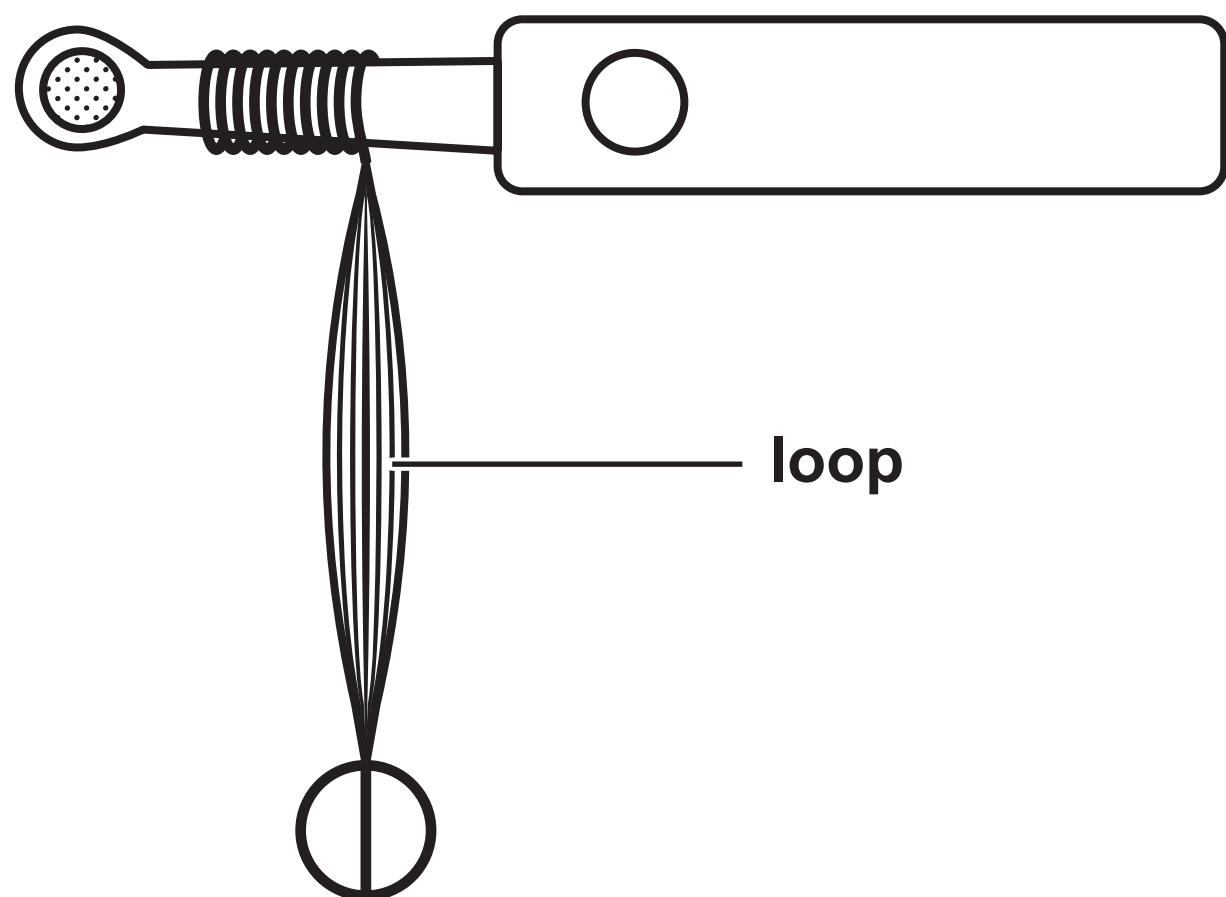
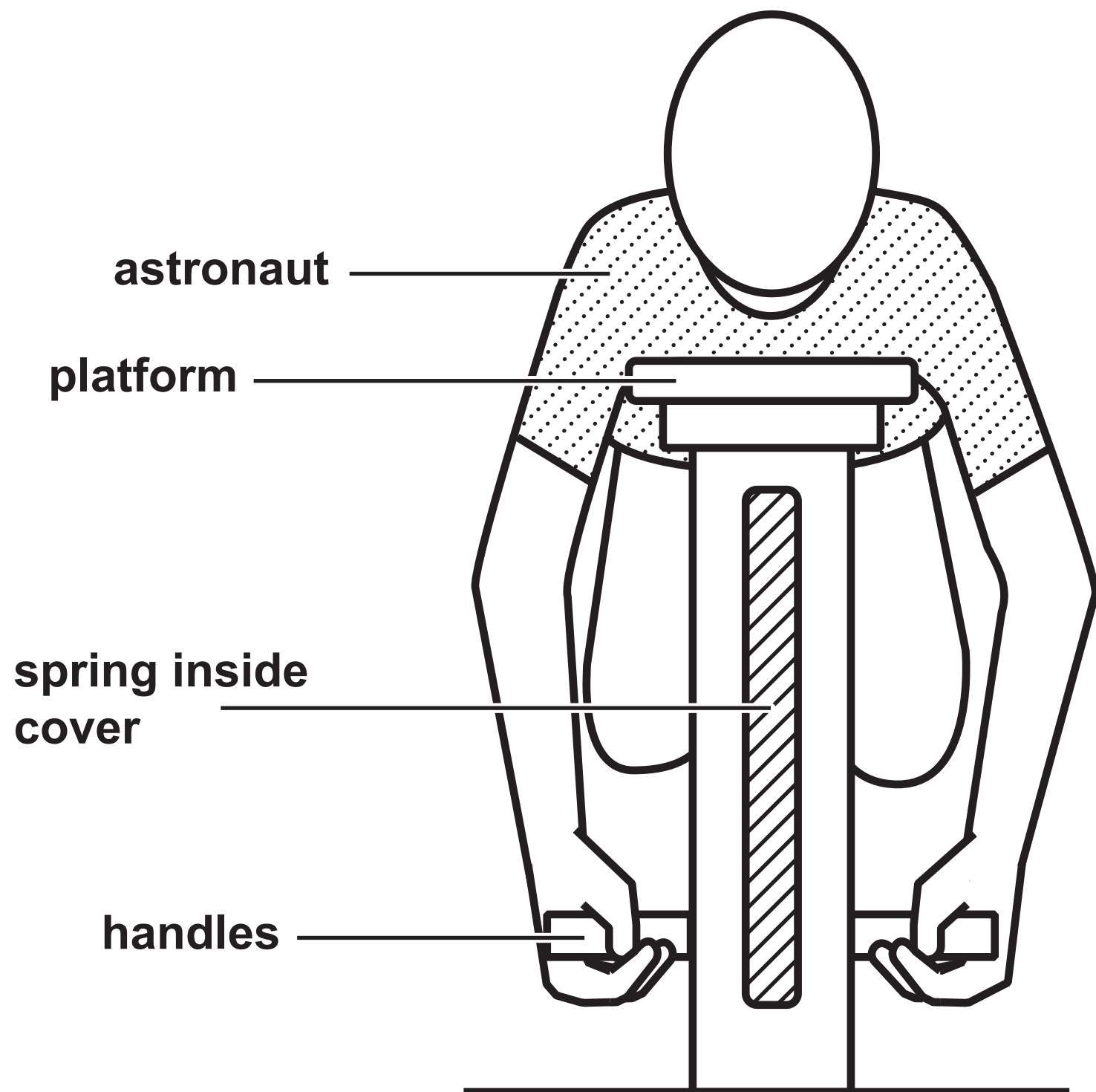


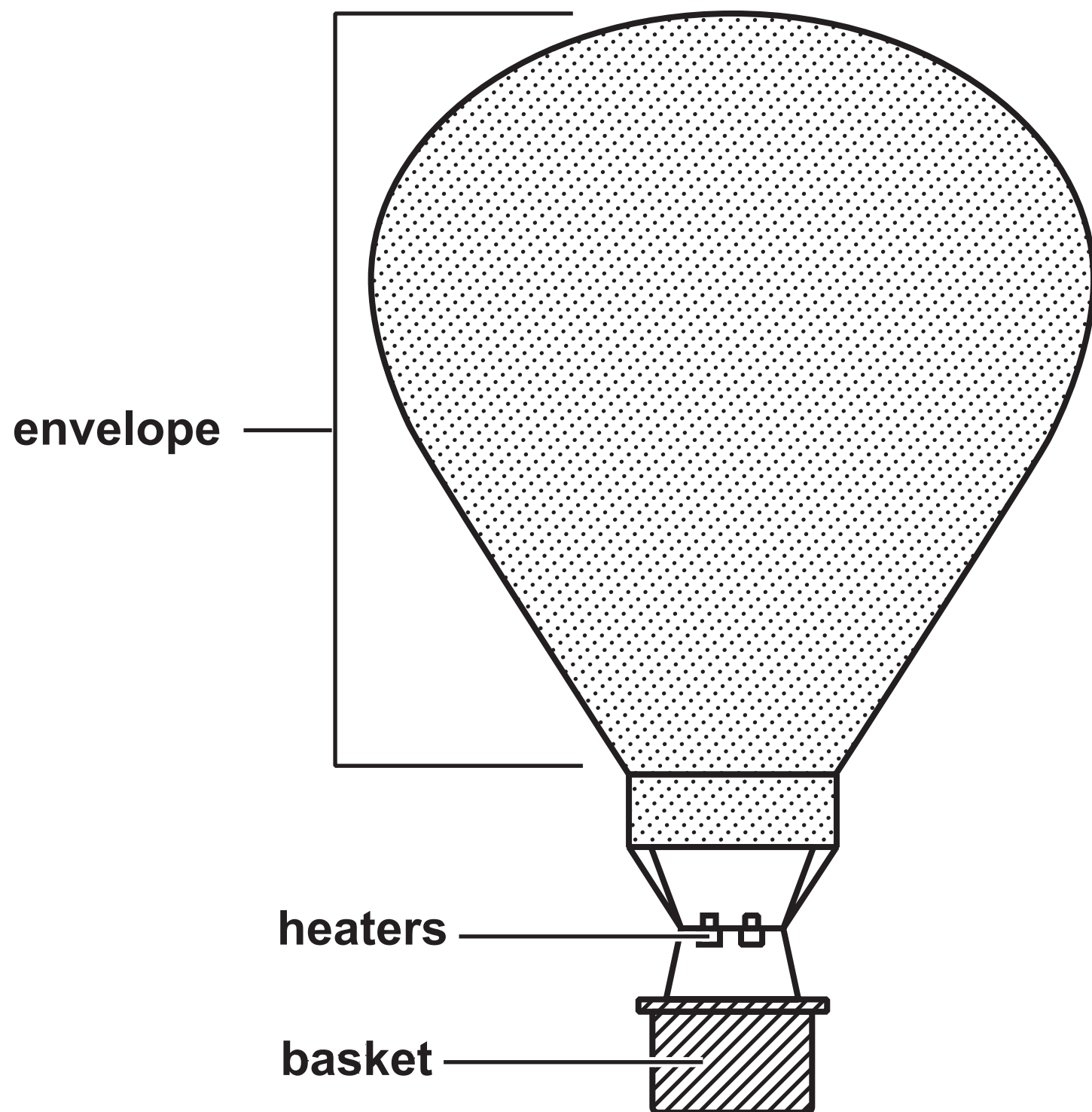
DIAGRAM 2



Question 16



Question 17(a)



Question 18(b)

Not to scale

$$n = 5 \quad \underline{\hspace{1cm}} \quad -0.54 \text{ eV}$$

$$n = 4 \quad \underline{\hspace{1cm}} \quad -0.85 \text{ eV}$$

$$n = 3 \quad \underline{\hspace{1cm}} \quad -1.51 \text{ eV}$$

$$n = 2 \quad \underline{\hspace{1cm}} \quad -3.40 \text{ eV}$$

$$n = 1 \quad \underline{\hspace{1cm}} \quad -13.6 \text{ eV}$$

Isotope	Decay product	Emission	Half-life
americium-241	neptunium-237	alpha	432 years
neptunium-237	protactinium-233	alpha	2 100 000 years
protactinium-233	uranium-233	beta	27 days

Question 16

(Source adapted from: <https://www.nasa.gov/content/nasa-astronaut-rick-mastracchio-3>)