

Physics
UNIT: 4PH1
PAPER: 2P

Friday 14 June 2024 – Afternoon
Time: 1 hour 15 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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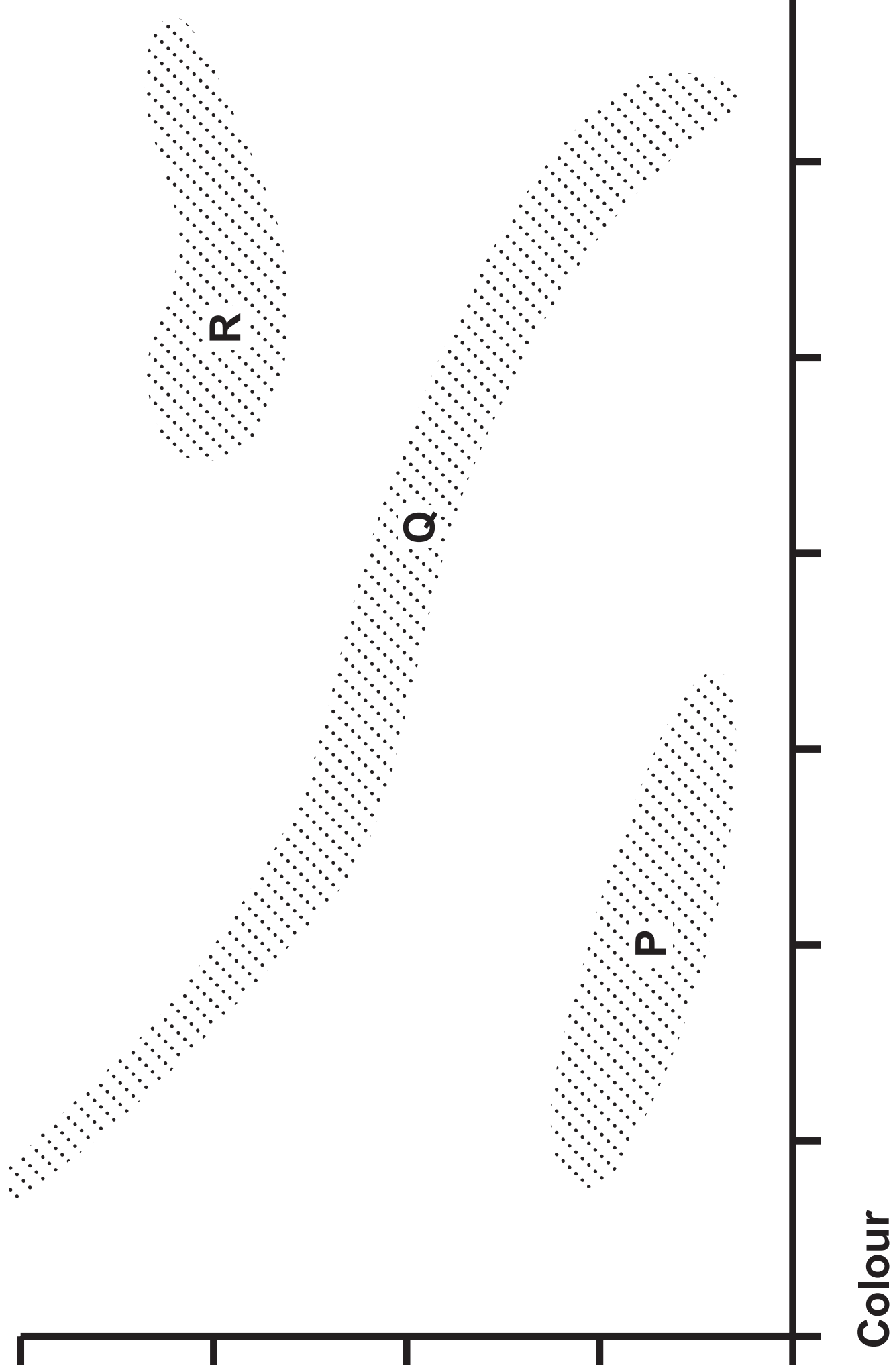
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Question 1

Absolute
magnitude



Question 1(a)

Region

Astronomical object

P

Q

R

black hole

main sequence star

nebula

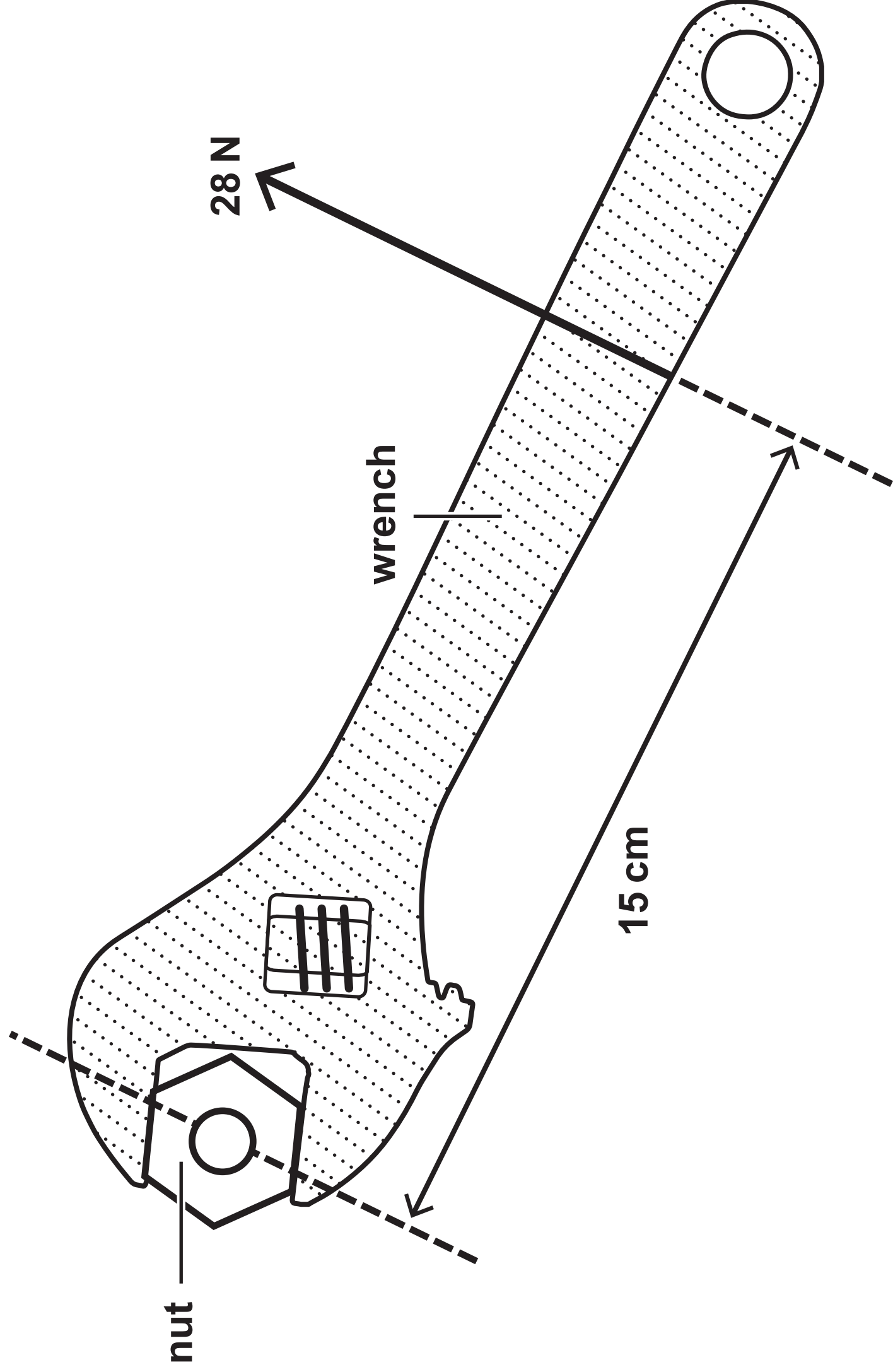
neutron star

red giant star

supernova

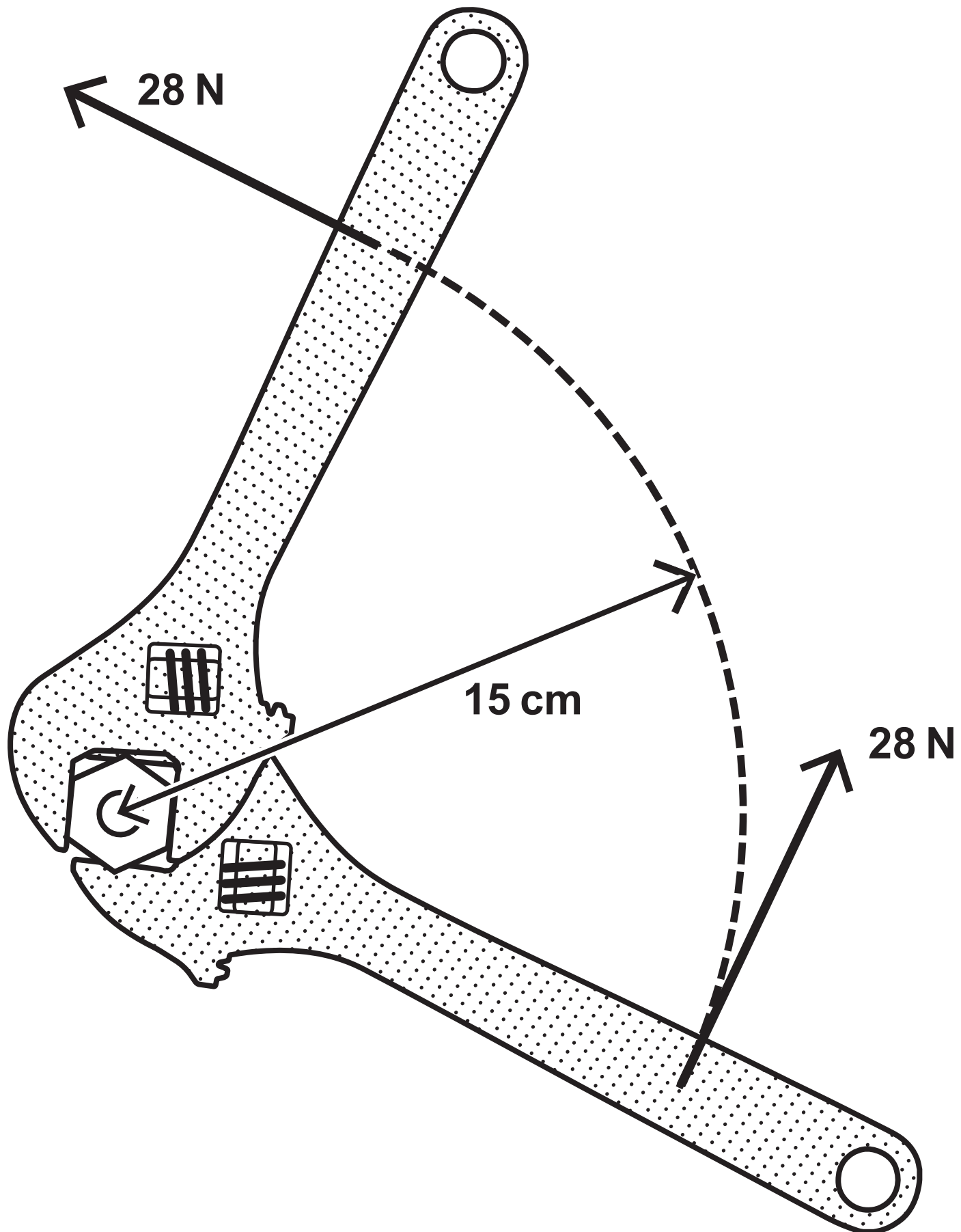
white dwarf star

DIAGRAM 1

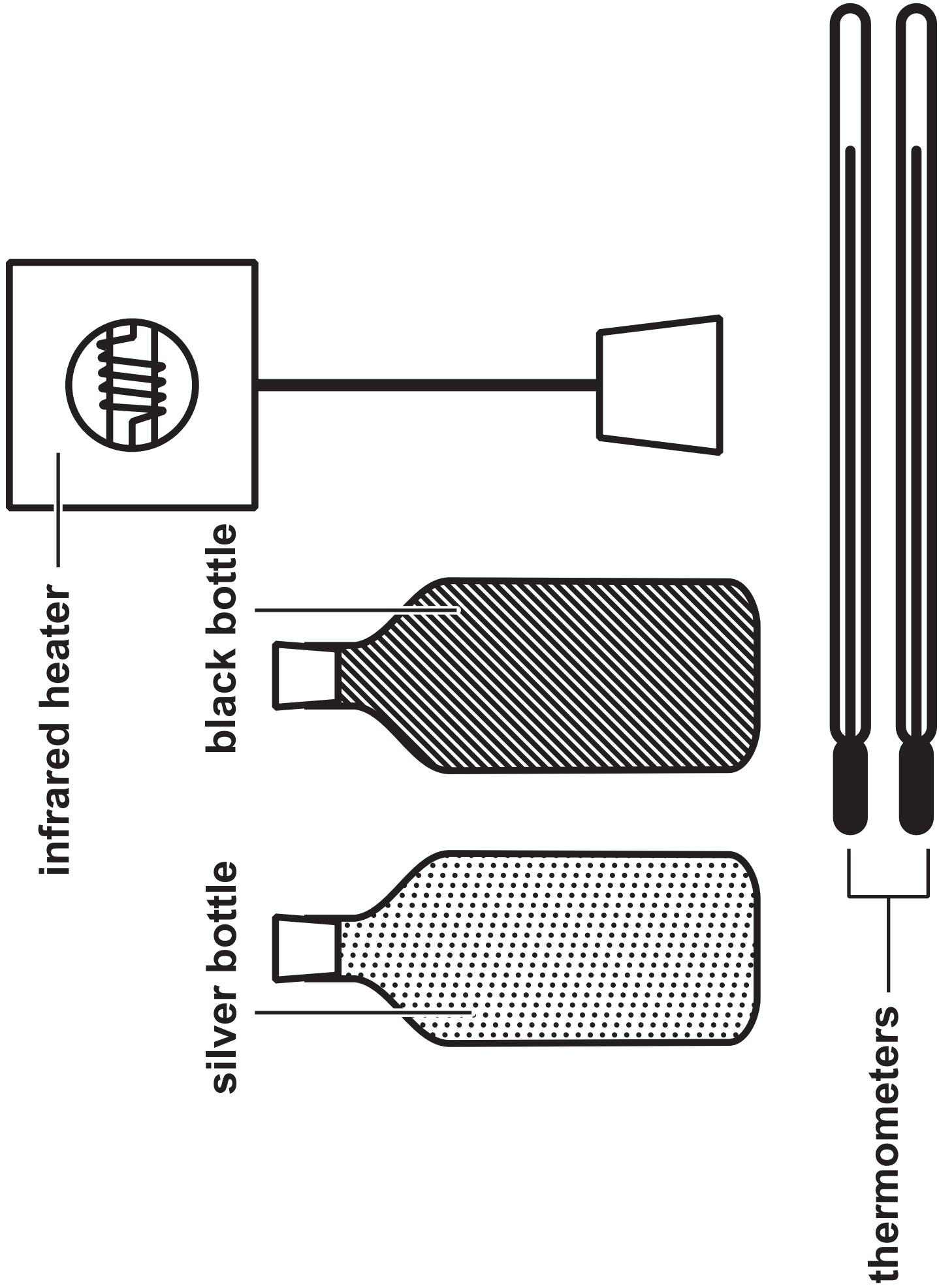


Question 2(c)

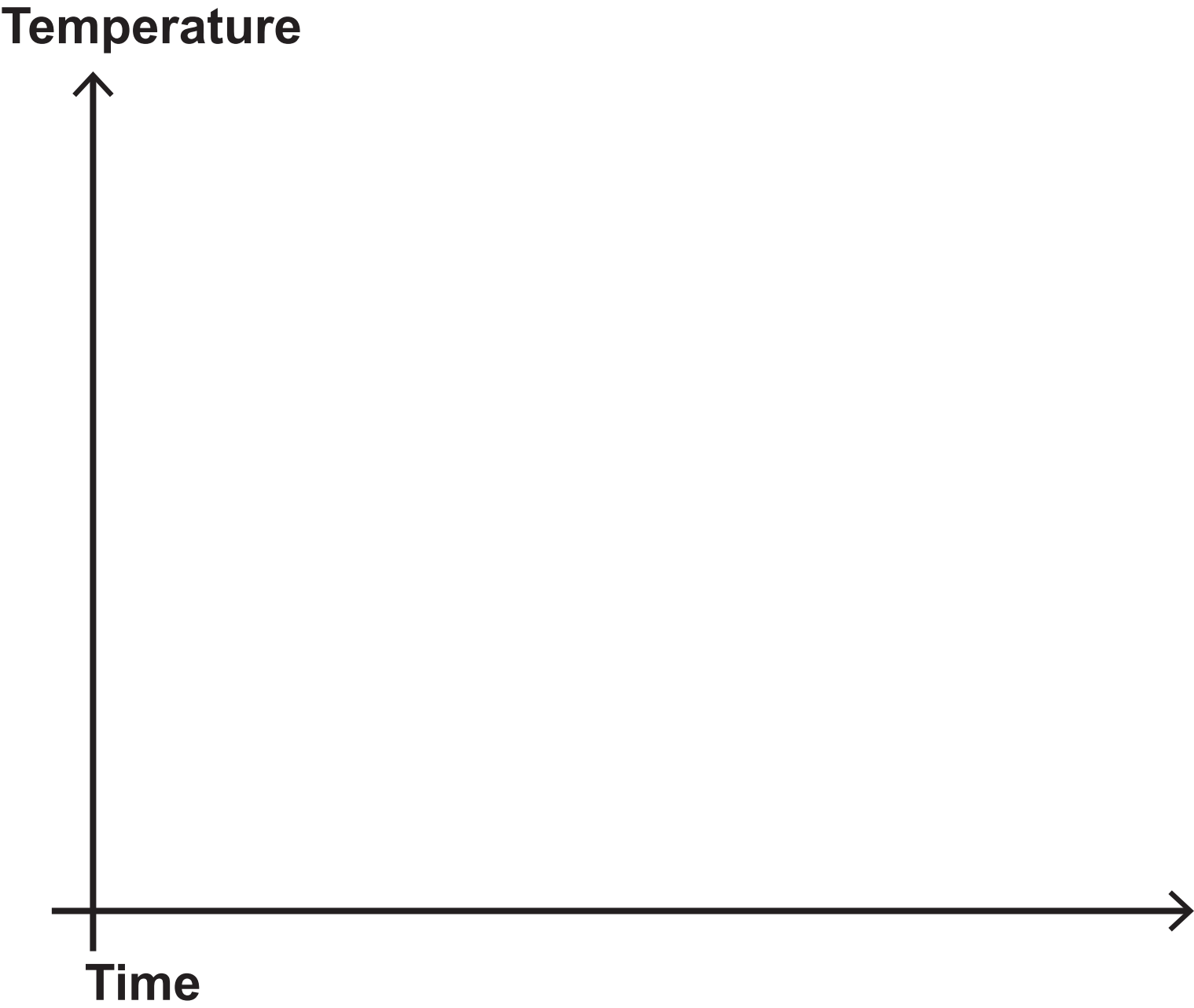
DIAGRAM 2



Question 3(a)



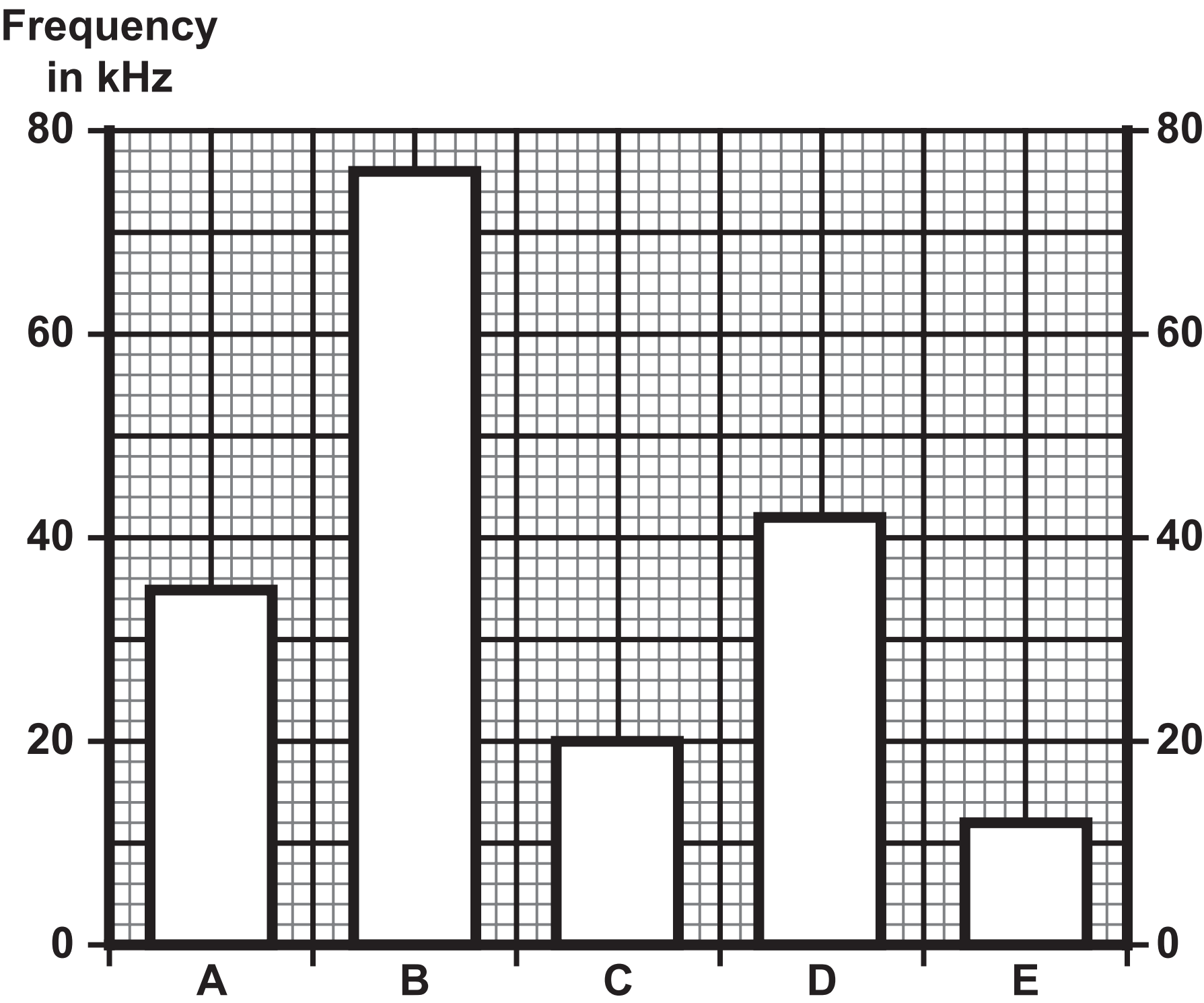
Question 3(b)



Question 4(b)

Material	Charge in nanocoulombs (nC)			
	1	2	3	Mean
glass	+35	+38	+36	+36
ebonite	−168	−170	−171	−170
polythene	−61	−80	−59	
acetate	−20	−20	−18	−19

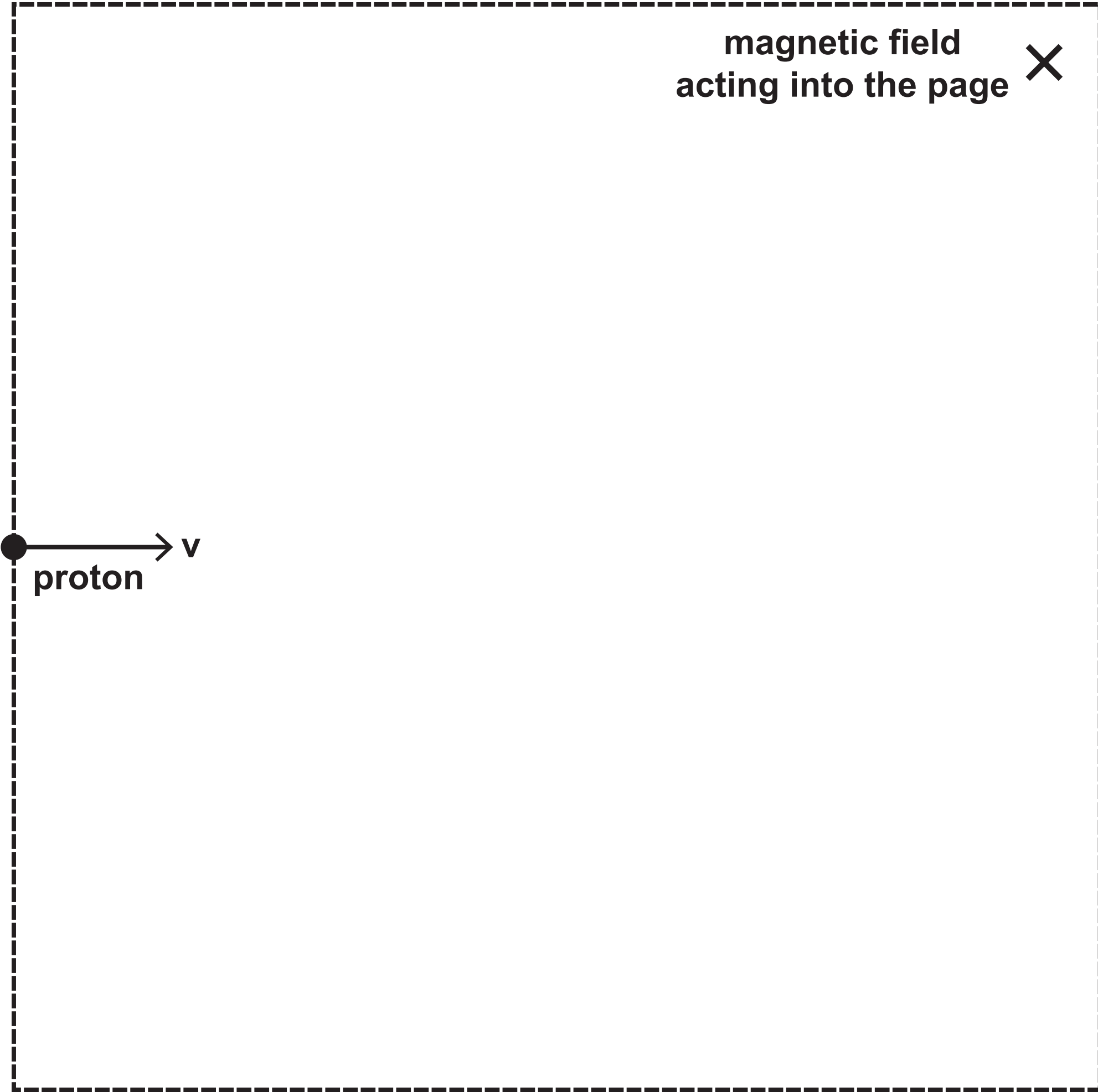
Question 5(b)

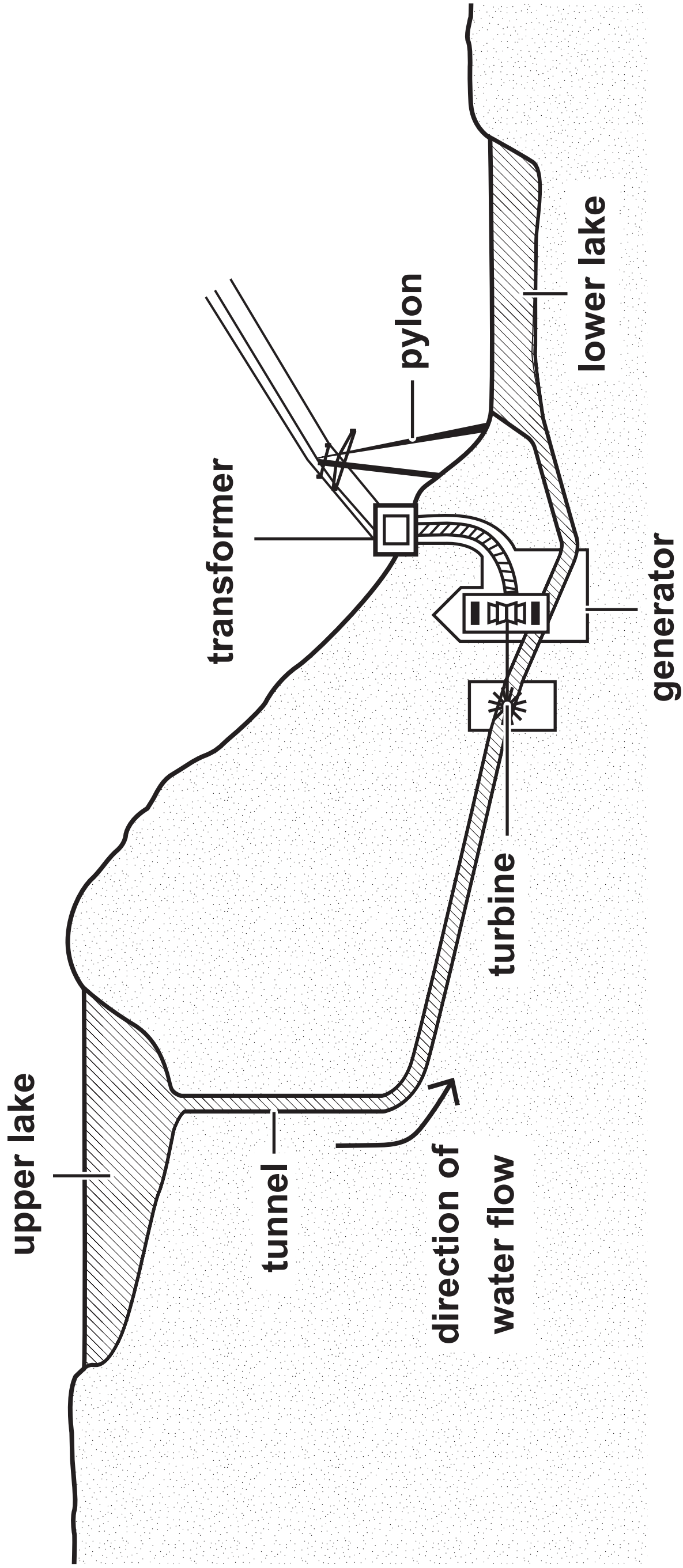


Question 5(c)(ii)

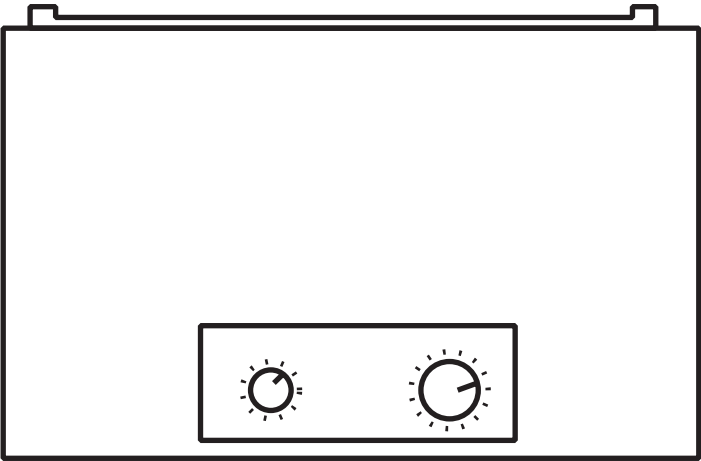
[illegible]

Question 6(b)





Question 8



Question 8(b)(ii)

Initial temperature of water	15 °C
Final temperature of water	60 °C
Voltage of heating element	230 V
Current in heating element	1.5 A
Time taken to heat water	45 minutes

Question 1(a)

Region

Astronomical object

P

Q

R

black hole

main sequence star

nebula

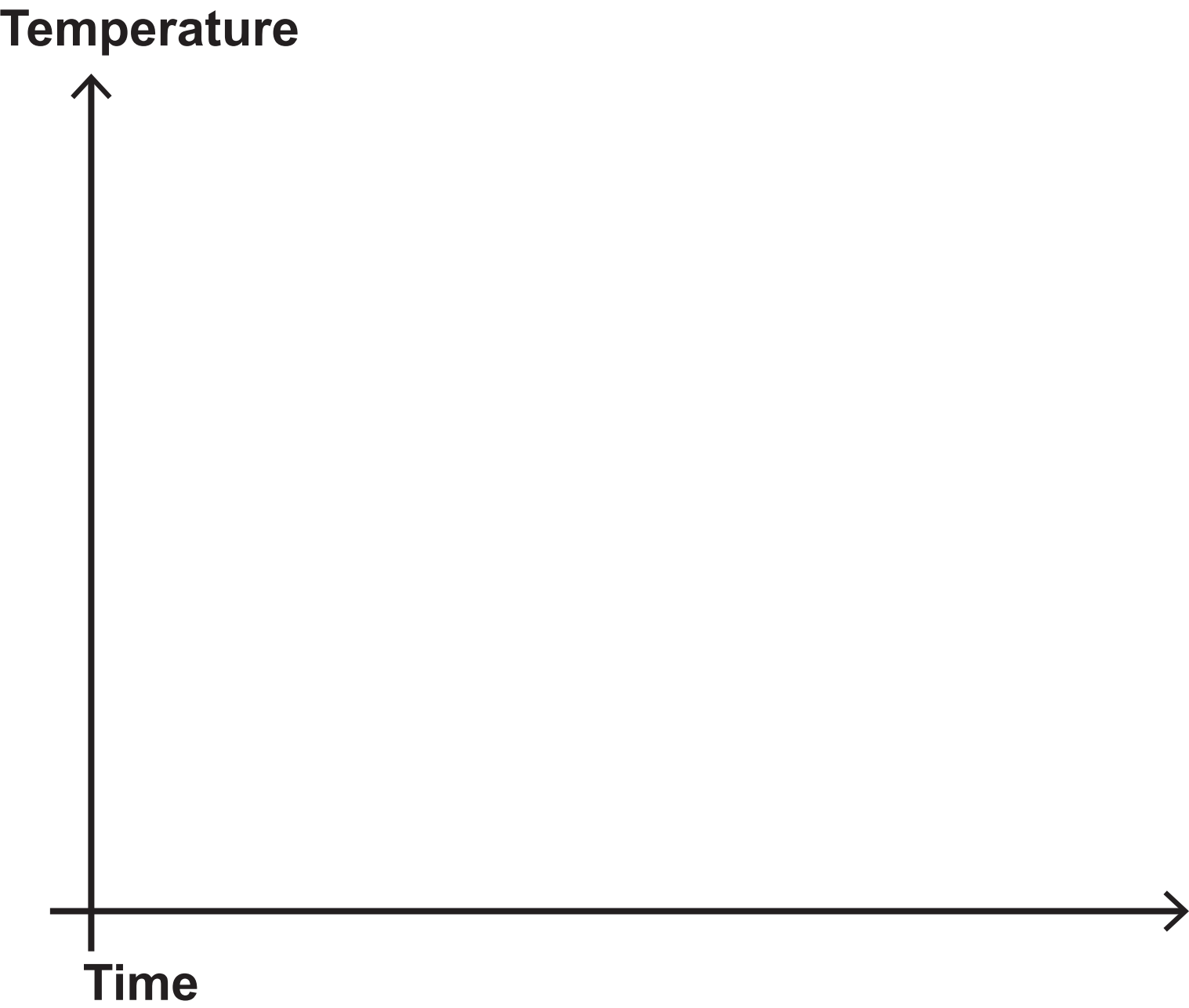
neutron star

red giant star

supernova

white dwarf star

Question 3(b)



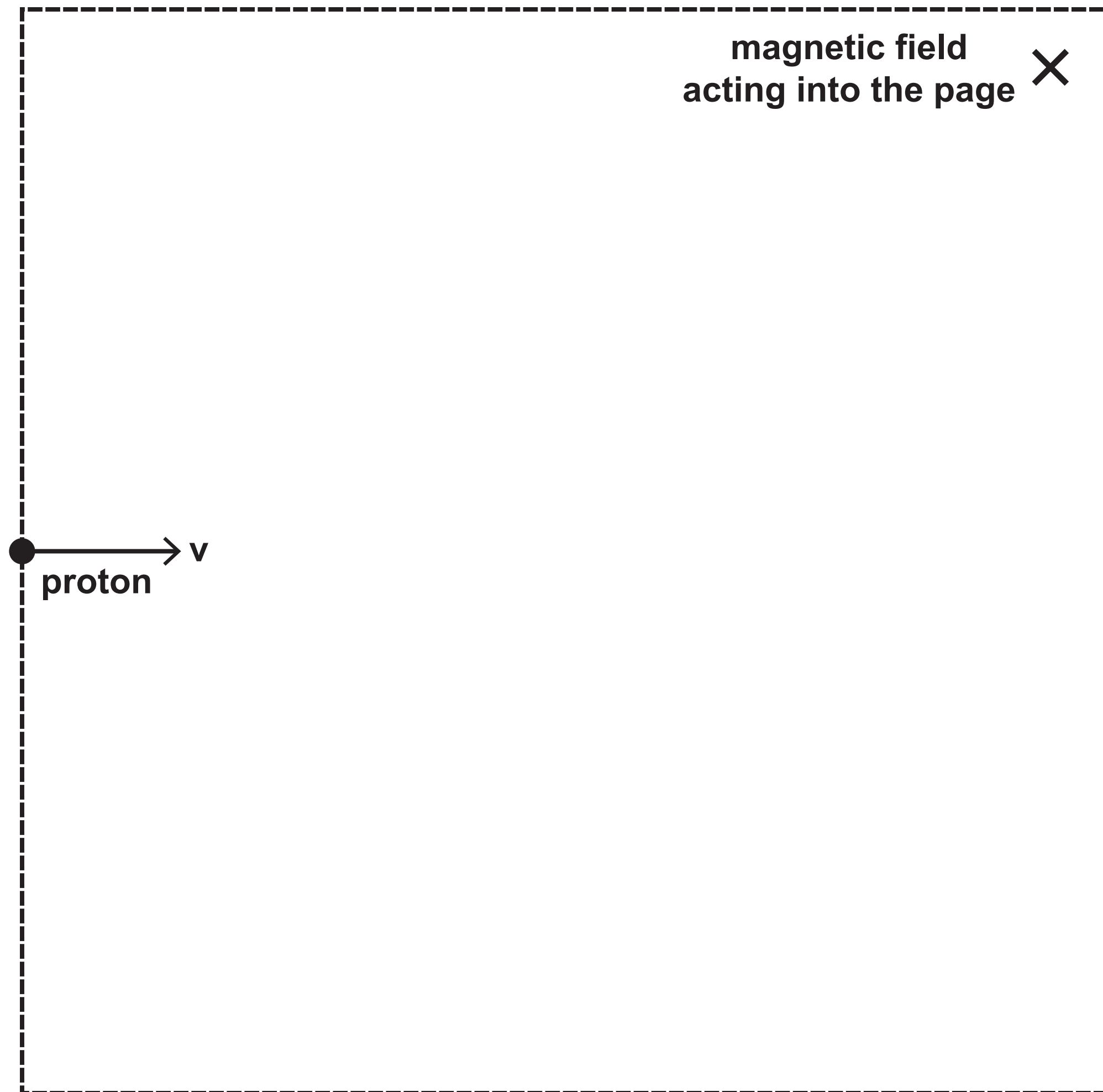
Question 4(b)

Material	Charge in nanocoulombs (nC)			
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polythene	−61	−80	−59	
acetate	−20	−20	−18	−19

Question 5(c)(ii)

[illegible]

Question 6(b)



Source information:

Question 2(a) and 2(c)

(Source adapted from: <https://www.shutterstock.com/image-photo/adjustable-spanner-isolated-on-white-chrome-1794553030>)