

Physics
UNIT: 4PH1
PAPER: 2P

Diagram Booklet

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.

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

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Question 1(b)

Toaster = 1068 W

Kettle = 2025 W

Laptop = 47 W

Electric drill = 713 W

Television = 59 W

Hair dryer = 1511 W

Question 1(c)

199 W

202 W

201 W

213 W

200 W

201 W

Question 1(c)

199 W

202 W

201 W

213 W

200 W

201 W

Question 2(b)

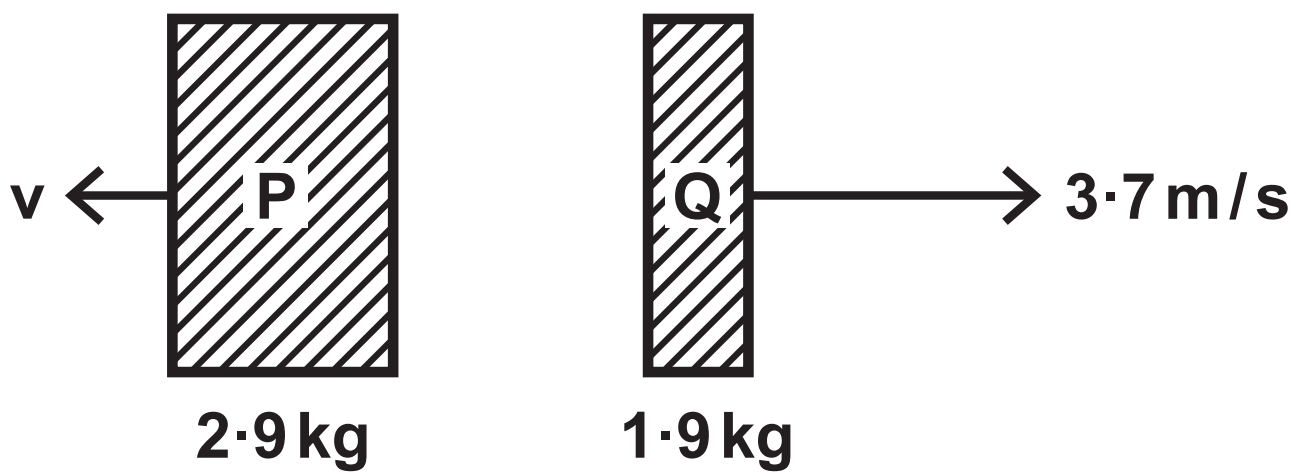
BEFORE



stationary

4·8 kg

AFTER



Question 3(a)

Charger X

Input voltage = 230 V

Output voltage = 5.0 V

Output current = 1.2 A

Question 3(b)(iii)

Charger Y

Input voltage = 230 V

Output voltage = 5.0 V

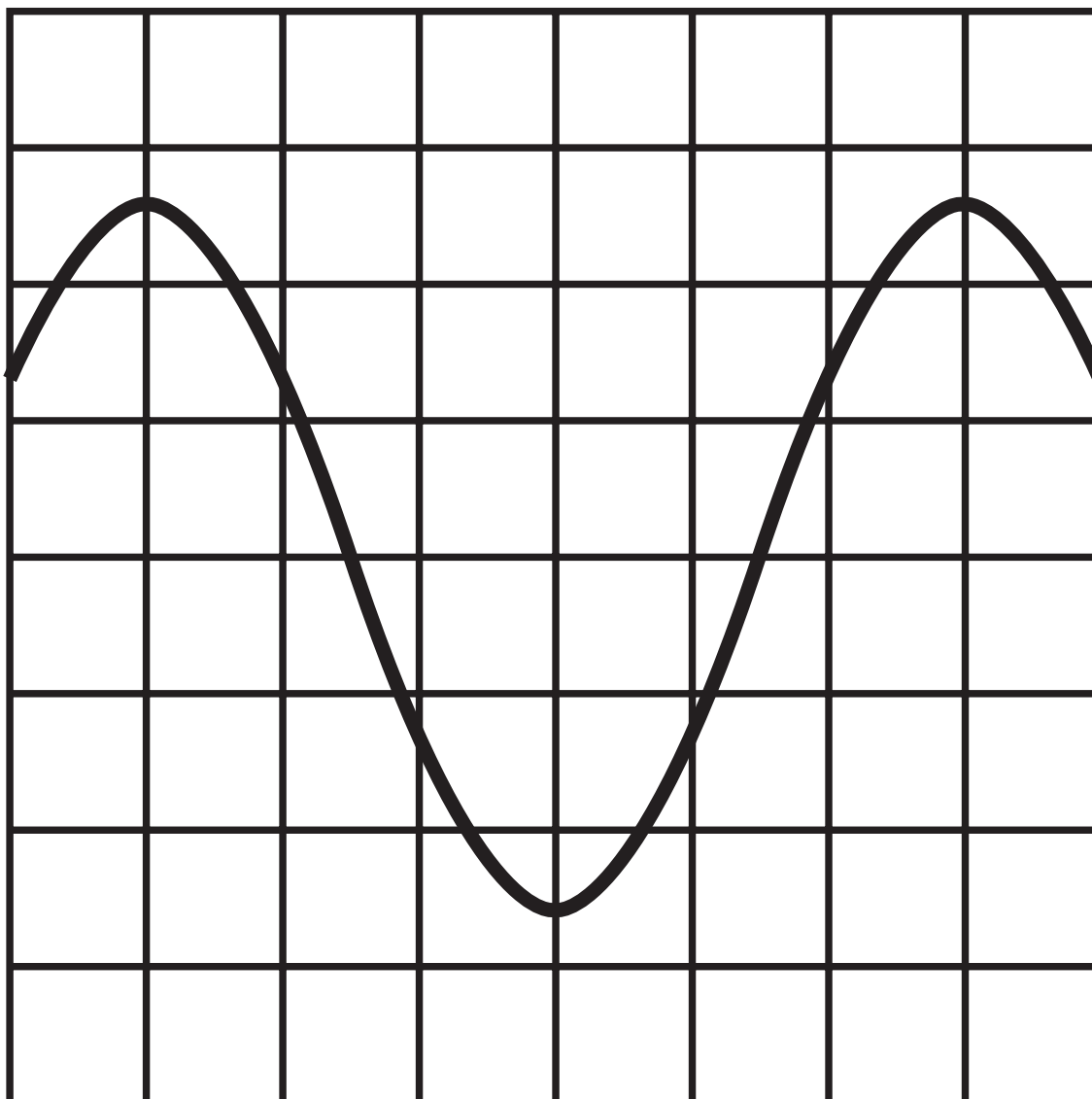
Output current = 2.1 A

Question 4(c)

oscilloscope settings:

y direction: 1 square = 2 V

x direction: 1 square = 5×10^{-6} s



Question 5(a)

| | Moderator | Control rod |
|--|-----------|-------------|
| absorbs excess neutrons | | |
| can be made of boron | | |
| can be made of water or graphite | | |
| is lowered into or raised from the reactor core to adjust the rate of reaction | | |
| reduces the speed of neutrons so they are more likely to cause fission | | |

Question 5(a)

| | Moderator | Control rod |
|--|-----------|-------------|
| absorbs excess neutrons | | |
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| reduces the speed of neutrons so they are more likely to cause fission | | |

Question 5(c)

| | |
|--|---|
| Total mass of uranium in fuel pellet | 0·0088 kg |
| Percentage (by mass) of uranium-235 in fuel pellet | 3·0 % |
| Mass of uranium-235 atom | $3·90 \times 10^{-25} \text{ kg}$ |
| Total energy released from fuel pellet due to fission | $2·17 \times 10^{10} \text{ J}$ |

Question 7(c)

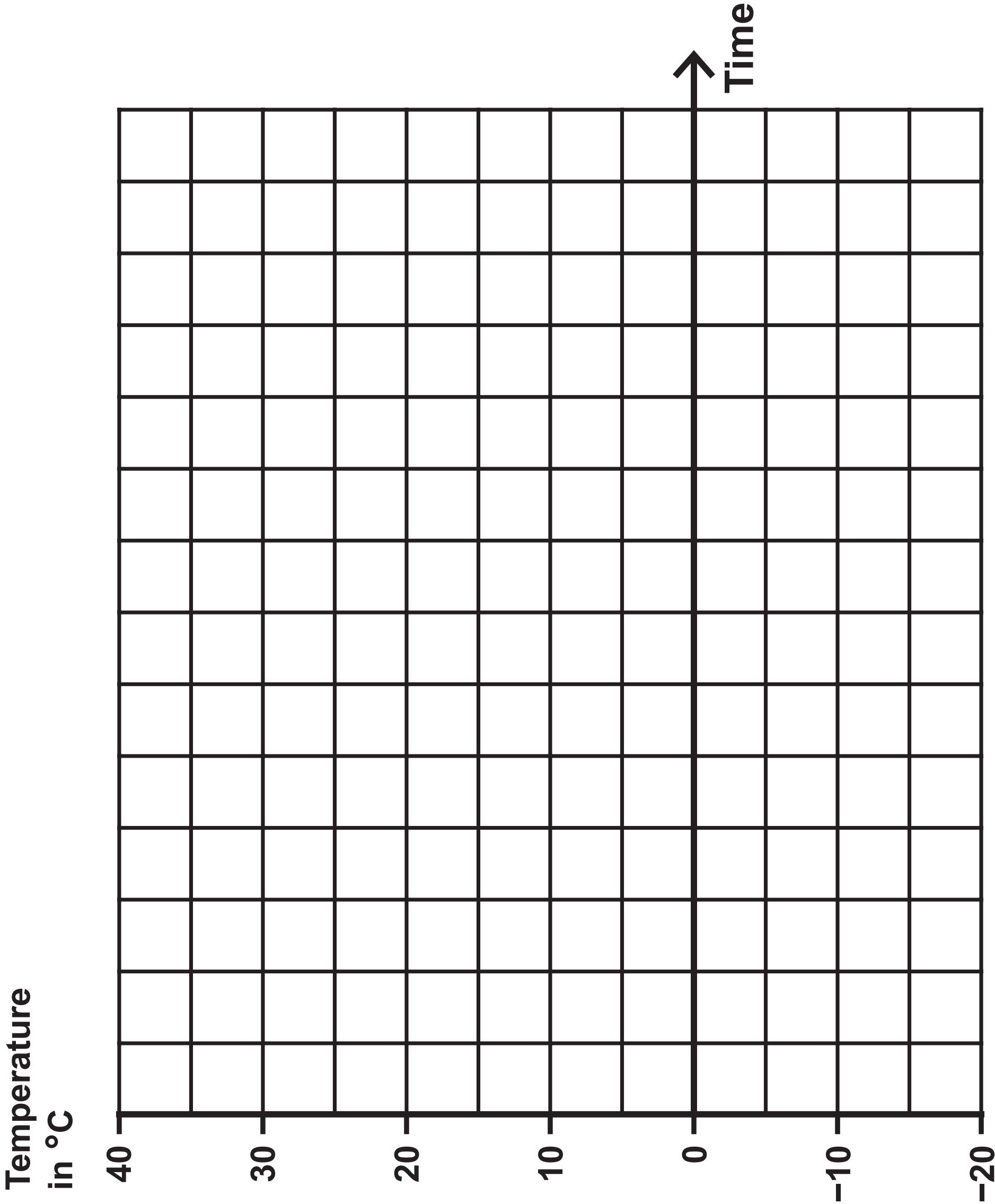
Mass of aluminium block = 1.6 kg

Mass of water = 2.3 kg

Initial temperature of water = 20 °C

Maximum temperature of water = 38 °C

Question 7(d)



Question 7(d)

