Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | | | | | |

Candidate Number | | | | |

Pearson Edexcel International GCSE (9–1)

Monday 15 June 2026

Morning (Time: 1 hour 15 minutes)

Paper reference **4PH1/2P**

Physics

UNIT: 4PH1
PAPER: 2P

You must have:
Ruler, calculator, Equation Booklet (enclosed)

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- Show all the steps in any calculations and state the units.

Information

- The total mark for this paper is 70.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Write your answers neatly and in good English.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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FORMULAE

You may find the following formulae useful.

energy transferred = current × voltage × time $E = I \times V \times t$

$$\text{frequency} = \frac{1}{\text{time period}} \qquad f = \frac{1}{T}$$

$$\text{power} = \frac{\text{work done}}{\text{time taken}} \qquad P = \frac{W}{t}$$

$$\text{power} = \frac{\text{energy transferred}}{\text{time taken}} \qquad P = \frac{E}{t}$$

$$\text{orbital speed} = \frac{2\pi \times \text{orbital radius}}{\text{time period}} \qquad v = \frac{2 \times \pi \times r}{T}$$

(final speed)^2 = (initial speed)^2 + (2 × acceleration × distance moved)

$$v^2 = u^2 + (2 \times a \times s)$$

pressure × volume = constant $p_1 \times V_1 = p_2 \times V_2$

$$\frac{\text{pressure}}{\text{temperature}} = \text{constant} \qquad \frac{p_1}{T_1} = \frac{p_2}{T_2}$$

$$\text{force} = \frac{\text{change in momentum}}{\text{time taken}} \qquad F = \frac{(mv - mu)}{t}$$

$$\frac{\text{change of wavelength}}{\text{wavelength}} = \frac{\text{velocity of a galaxy}}{\text{speed of light}} \qquad \frac{\lambda - \lambda_0}{\lambda_0} = \frac{\Delta\lambda}{\lambda_0} = \frac{v}{c}$$

change in thermal energy = mass × specific heat capacity × change in temperature

$$\Delta Q = m \times c \times \Delta T$$

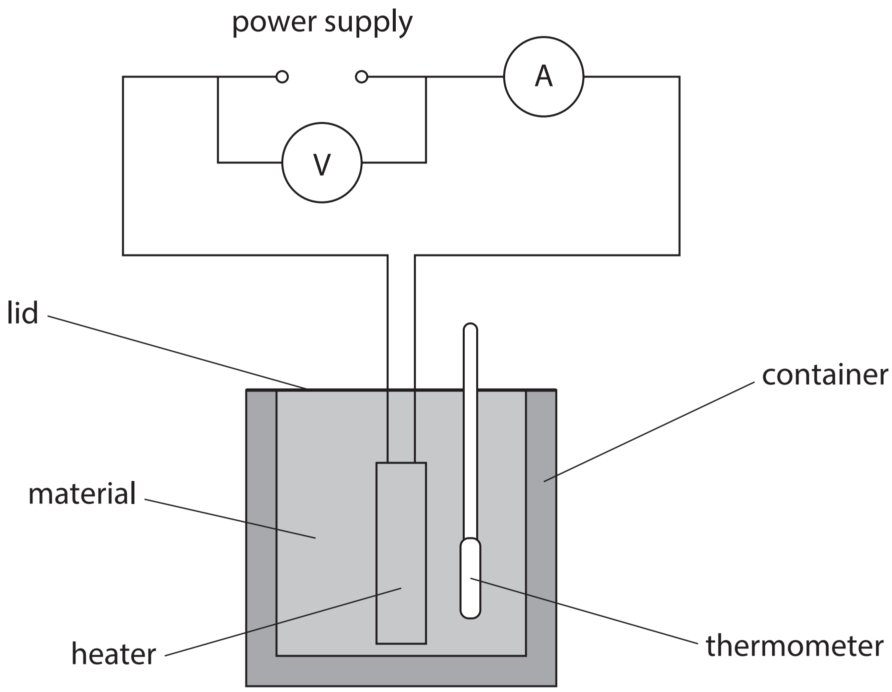
Where necessary, assume the acceleration of free fall, $g = 10\ \text{m/s}^2$.

Answer ALL questions. Write your answers in the spaces provided.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

1 A student investigates the specific heat capacity of a material.

The diagram shows some of the apparatus they use in their investigation.



This is the student's method.

Step 1 measure the mass of the material

Step 2 measure the initial temperature of the material

Step 3 switch on the heater

Step 4 measure the current and voltage of the heater

Step 5 allow the material to increase in temperature for two minutes

Step 6 switch off the heater

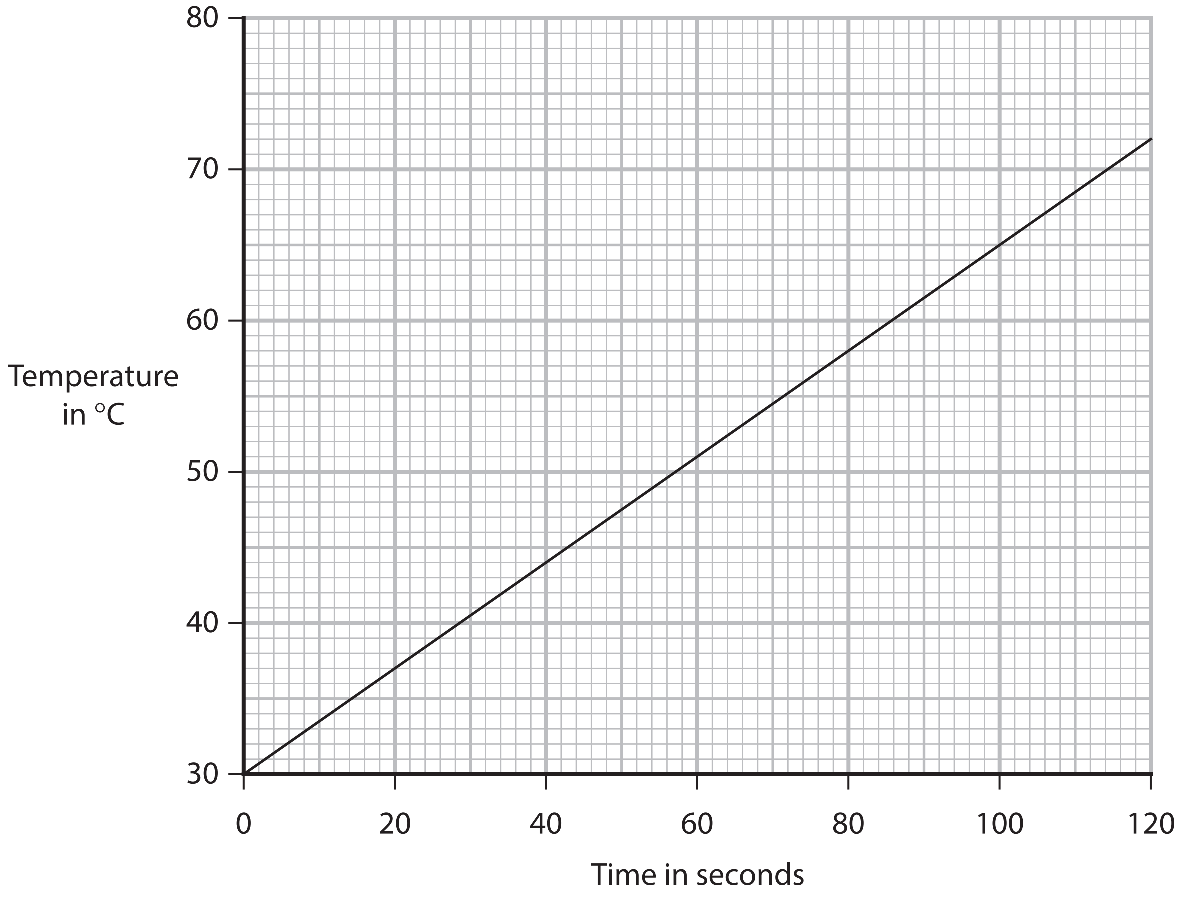
(a) Give two other pieces of apparatus the student needs for the investigation.

(2)

1 ....

2 ....

(b) The graph shows the student's results.



(i) What is the temperature change 80 seconds after the start of the investigation?

(1)

☒ **A** 28 °C

☒ **B** 30 °C

☒ **C** 42 °C

☒ **D** 72 °C

(ii) The power supply provides a current of 3.9 A and a voltage of 12 V to the heater.

Calculate the energy transferred to the material in the first 80 seconds.

(2)

energy transferred = ... J

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA

P 7 9 5 3 9 A 0 4 2 4

(iii) The material has a mass of 0.29 kg.

Calculate the specific heat capacity of the material.

(3)

specific heat capacity = ... J/kg °C

(Total for Question 1 = 8 marks)

2 This question is about moments.

(a) Diagram 1 shows some forces acting on a vertical beam.

The beam is in equilibrium.

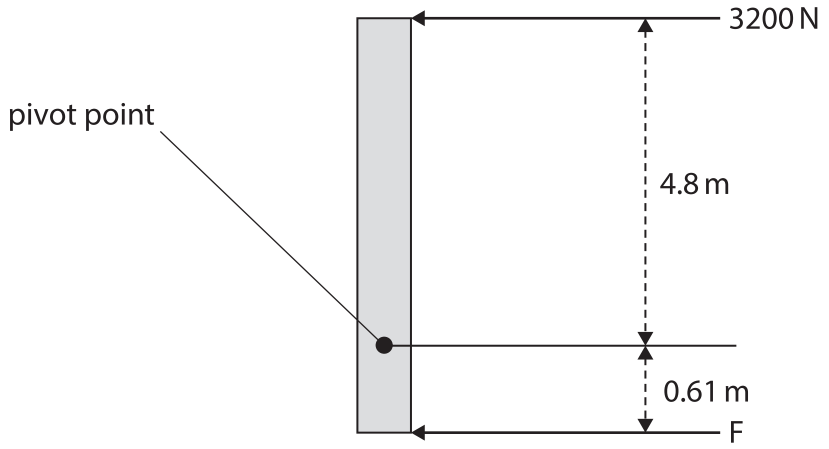


Diagram 1

(i) Calculate the moment of the 3200 N force.

Give the unit.

(3)

moment = ... unit ....

(ii) State the magnitude and the direction of the moment provided by force F.

(2)

magnitude = ...

direction = ...

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P 7 9 5 3 9 A 0 6 2 4

(b) The beam now rests on two supports.

Diagram 2 shows the forces acting on the beam.

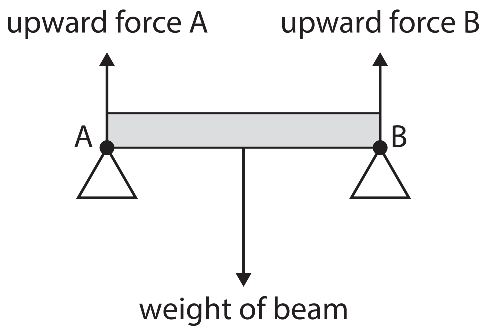

Diagram 2

The upward force on the beam from each support point is half of the weight of the beam.

Explain how the upward forces at point A and point B change

- when a person stands on the beam at point A
- as the person walks along the beam from point A to point B

Refer to ideas about moments in your answer.

(4)

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(Total for Question 2 = 9 marks)

3 This question is about magnets.

(a) Describe the construction of an electromagnet.

You may draw a diagram to help your answer.

(3)

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(b) Diagram 1 shows a metal bar placed near an electromagnet.

When the electromagnet is switched on, the metal bar becomes a magnet and experiences an attractive force.

Diagram 1

(i) Deduce which end of the metal bar is a north pole.

(2)

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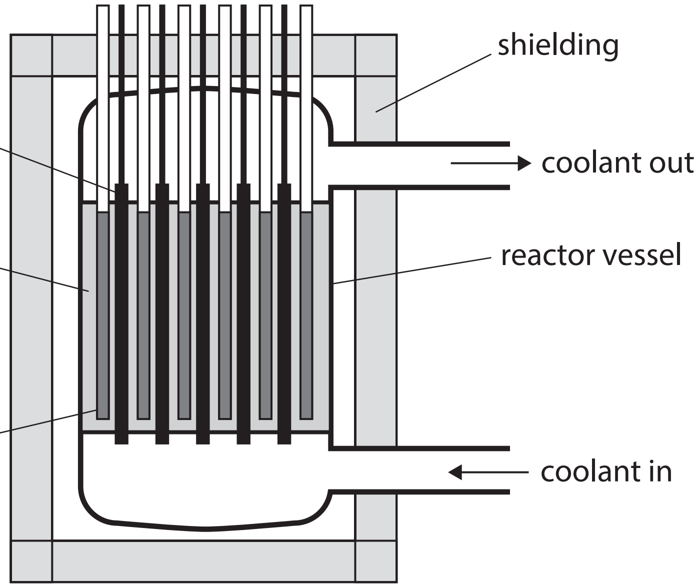
(ii) Draw four magnetic field lines on diagram 1 to show

- the field around the electromagnet
- the field between the electromagnet and the metal bar

(4)

(Total for Question 3 = 9 marks)

4 The diagram shows a nuclear fission reactor.



(a) The fission reactor is used in a power station to generate electricity on a large scale.

Describe how energy transfers cause changes in the energy stores in a nuclear fission power station.

(4)

(b) In a nuclear power station, the reactor is shielded in concrete.

Explain why a worker in a power station might still need to take safety precautions.

(2)

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(c) (i) State the formula linking efficiency, useful output energy and total output energy.

(1)

(ii) In the power station, the fission of 1.0 kg of uranium-235 fuel gives a power output of 2.4×10^{10} W for 3600 seconds.

3.2×10^{13} J of the energy is transferred usefully to the National Grid.

Calculate the efficiency of the power station.

Give your answer as a percentage.

(3)

efficiency = ...%

(Total for Question 4 = 10 marks)

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5 A student investigates the forces acting on two balloons, X and Y, when they are charged by friction.

Diagram 1 shows these balloons at the start of the investigation when they are uncharged.

The balloons are attached by strings to a beam.

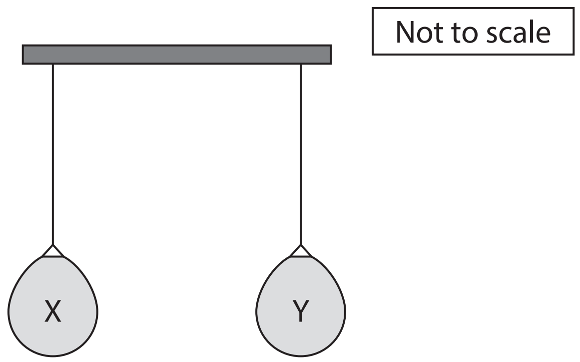

Diagram 1

(a) Diagram 2 shows the two balloons after the student has rubbed them together and then separated them.

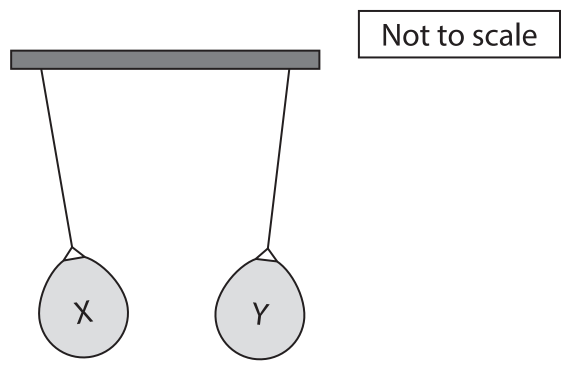

Diagram 2

Balloon X and balloon Y attract each other.

Describe how balloon X and balloon Y have become charged.

(3)

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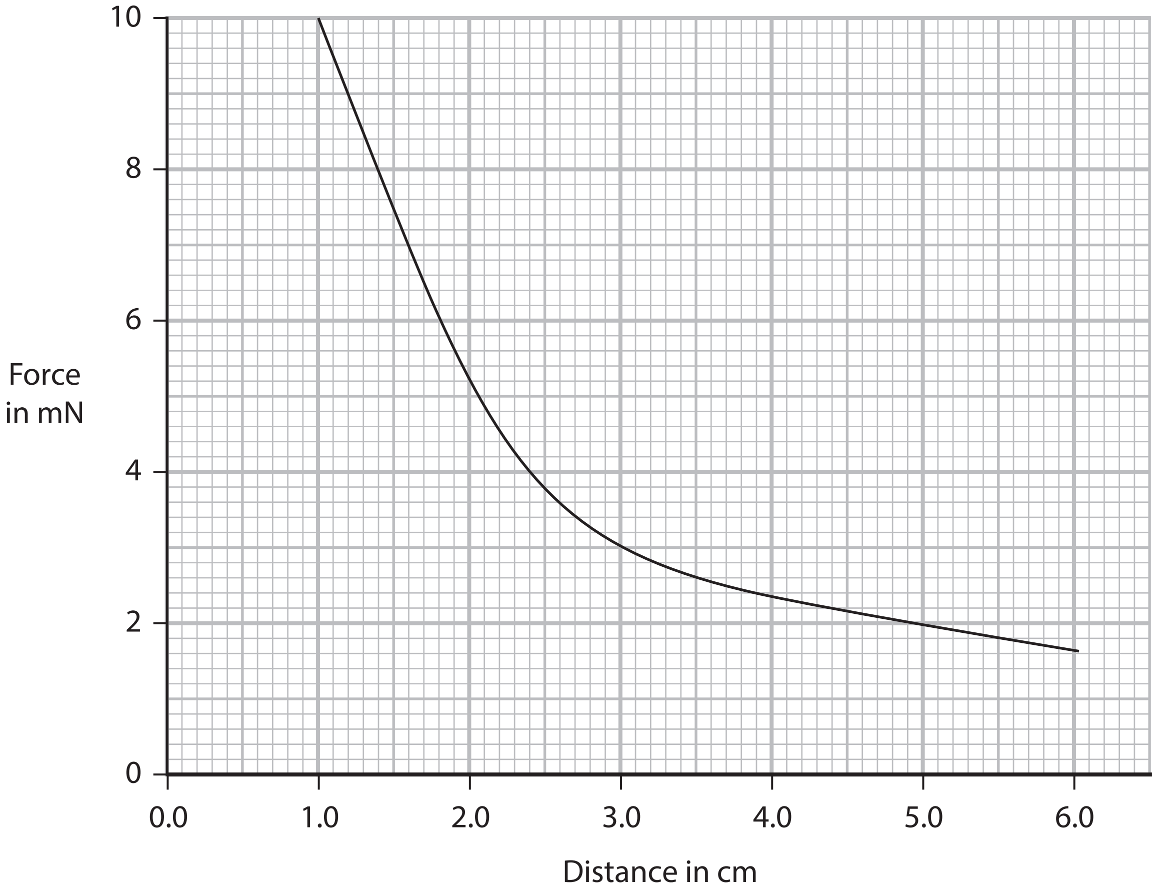
(b) The student changes the distance between the two balloons and measures the force of attraction between them.

The graph shows the student's results.



The student suggests that the distance between the two balloons and the force of attraction between the two balloons obey this relationship

$$(\text{distance})^2 \times \text{force} = \text{constant}$$

Use data from the graph to determine if the results from the investigation support this relationship.

(4)

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(Total for Question 5 = 7 marks)

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6 A student uses a sound generator to investigate the highest frequency of sound that different animals can hear.

(a) What is the accepted range of human hearing?

(1)

☒ **A** 2 Hz to 20 000 Hz

☒ **B** 20 Hz to 20 000 Hz

☒ **C** 20 Hz to 200 000 Hz

☒ **D** 200 Hz to 2000 Hz

(b) (i) Describe how the student could use an oscilloscope and a microphone to measure the time period of a sound wave.

(2)

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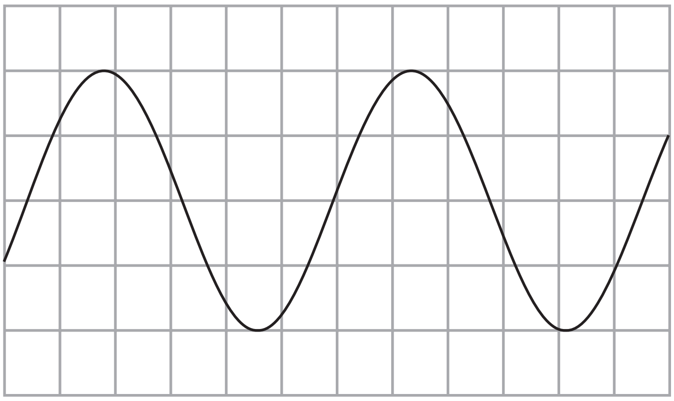
(ii) The diagram shows the oscilloscope trace.



Oscilloscope settings:

y-direction: 1 square = 50 mV

x-direction: 1 square = 1.0×10^{-5} s

Determine the frequency of the sound wave.

(3)

frequency = ... Hz

(c) The table shows the student's results for some animals.

Animal	Highest frequency heard in kHz
cat	64
dog	45
cow	35
horse	32

(i) Plot a bar chart of the student's results on the grid.

(3)

(ii) Discuss why a bar chart is a more appropriate choice than a scatter graph for the student's results.

(2)

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(Total for Question 6 = 11 marks)

7 This question is about the spectrum produced by light from stars.

(a) Explain how the redshift of light from galaxies provides evidence for the Big Bang theory of the universe.

(3)

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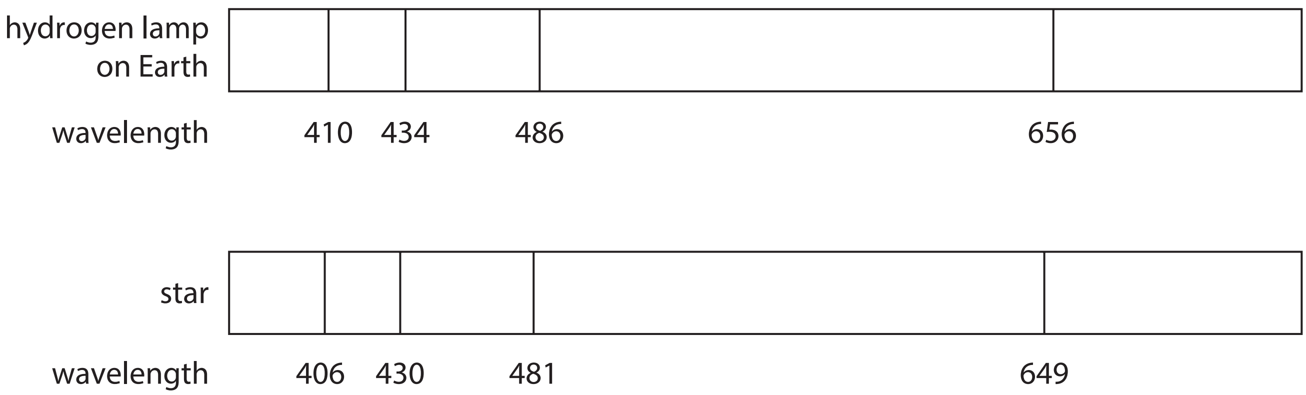
(b) The diagram shows the spectrum of light from a star and from a hydrogen lamp on Earth.



All wavelengths are in nanometres.

A student suggests that the star appears red because it is moving away from the Earth at 1% of the speed of light.

Use data from the diagram to evaluate the student's suggestion.

[speed of light = 3.0×10^8 m/s]

(4)

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(Total for Question 7 = 7 marks)

8 This question is about the Doppler effect.

(a) Diagram 1 shows wavefronts of sound waves from a car as experienced by an observer.

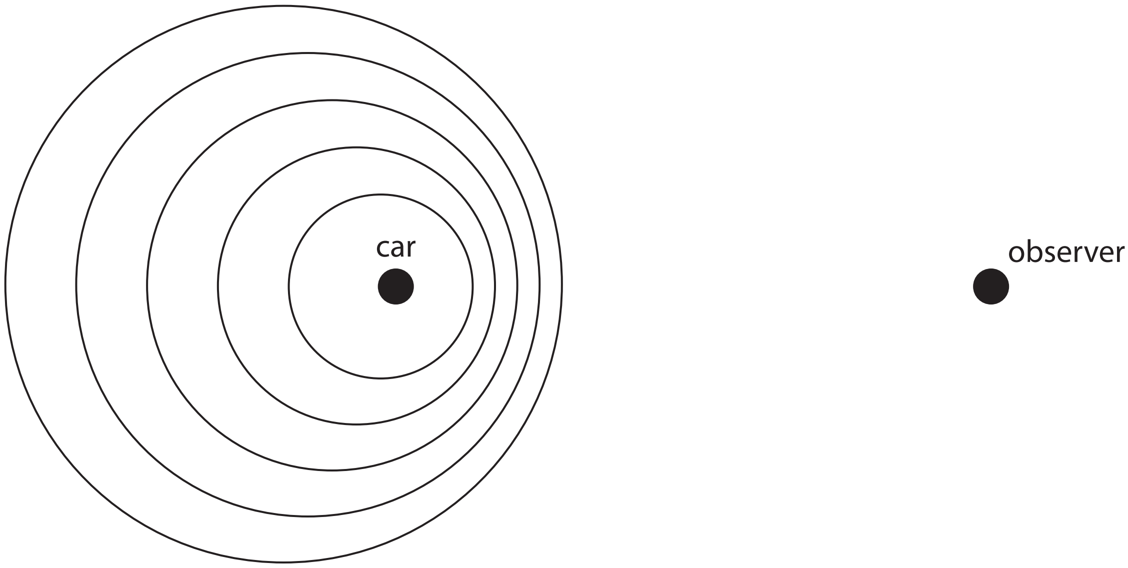

Diagram 1

(i) Which direction is the car travelling?

(1)

- ☒ **A** away from the observer
- ☒ **B** into the page
- ☒ **C** out of the page
- ☒ **D** towards the observer

(ii) Explain why the frequency of the sound heard by the observer is higher than the frequency of the sound heard by the car driver.

(2)

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(b) Diagram 2 shows a spacecraft directly below the International Space Station (ISS).

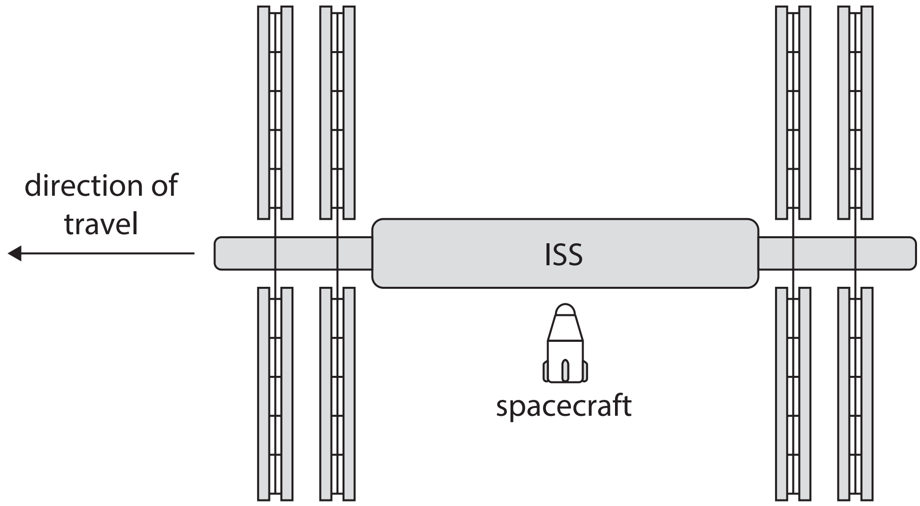

Diagram 2

When radio signals pass between the ISS and the spacecraft, there is no Doppler effect.

Explain why there is no Doppler effect in radio signals between the ISS and the spacecraft even though both are in orbit around the Earth and travelling very quickly.

(2)

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QUESTION 8 CONTINUES ON THE NEXT PAGE

(c) Diagram 3 shows the spacecraft now moving upwards towards the ISS.

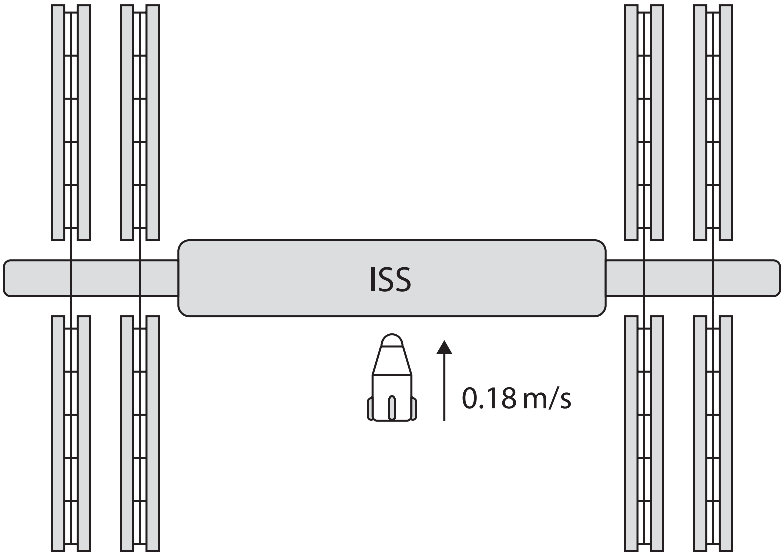

Diagram 3

The spacecraft moves towards the ISS with an upward velocity of 0.18 m/s.

The mass of the spacecraft is 12 000 kg and the mass of the ISS is 420 000 kg.

When the spacecraft touches the ISS, they move upwards together.

Calculate the upward velocity of the combined object.

(4)

upward velocity = ... m/s

(Total for Question 8 = 9 marks)

TOTAL FOR PAPER = 70 MARKS

Pearson Edexcel International GCSE (9–1)

Monday 15 June 2026

Morning (Time: 1 hour 15 minutes)

Paper reference	4PH1/2P

Physics

UNIT: 4PH1

PAPER: 2P

Equation Booklet

Do not return this Booklet with the question paper.

Turn over

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P 7 9 5 3 9 A

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These equations may be required for both International GCSE Physics (4PH1) and International GCSE Combined Science (4SD0) papers.

1. Forces and Motion	
average speed = $\frac{\text{distance moved}}{\text{time taken}}$	
acceleration = $\frac{\text{change in velocity}}{\text{time taken}}$	$a = \frac{(v-u)}{t}$
$(\text{final speed})^2 = (\text{initial speed})^2 + (2 \times \text{acceleration} \times \text{distance moved})$	$v^2 = u^2 + (2 \times a \times s)$
force = mass × acceleration $F = m \times a$	
weight = mass × gravitational field strength	$W = m \times g$
2. Electricity	
power = current × voltage	$P = I \times V$
energy transferred = current × voltage × time	$E = I \times V \times t$
voltage = current × resistance	$V = I \times R$
charge = current × time	$Q = I \times t$
energy transferred = charge × voltage	$E = Q \times V$
3. Waves	
wave speed = frequency × wavelength	$v = f \times \lambda$
frequency = $\frac{1}{\text{time period}}$	$f = \frac{1}{T}$
refractive index = $\frac{\sin(\text{angle of incidence})}{\sin(\text{angle of refraction})}$	$n = \frac{\sin i}{\sin r}$
$\sin(\text{critical angle}) = \frac{1}{\text{refractive index}}$	$\sin c = \frac{1}{n}$

4. Energy resources and energy transfers	
efficiency = $\dfrac{\text{useful energy output}}{\text{total energy output}} \times 100\%$	
work done = force × distance moved	$W = F \times d$
gravitational potential energy = mass × gravitational field strength × height	$GPE = m \times g \times h$
kinetic energy = $\frac{1}{2}$ × mass × speed^2	$KE = \frac{1}{2} \times m \times v^2$
power = $\dfrac{\text{work done}}{\text{time taken}}$	$P = \dfrac{W}{t}$
5. Solids, liquids and gases	
density = $\dfrac{\text{mass}}{\text{volume}}$	$\rho = \dfrac{m}{V}$
pressure = $\dfrac{\text{force}}{\text{area}}$	$p = \dfrac{F}{A}$
pressure difference = height × density × gravitational field strength	$p = h \times \rho \times g$
$\dfrac{\text{pressure}}{\text{temperature}}$ = constant	$\dfrac{p_1}{T_1} = \dfrac{p_2}{T_2}$
pressure × volume = constant	$p_1 \times V_1 = p_2 \times V_2$
8. Astrophysics	
orbital speed = $\dfrac{2 \times \pi \times \text{orbital radius}}{\text{time period}}$	$v = \dfrac{2 \times \pi \times r}{T}$

The equations on the following page will only be required for International GCSE Physics.

These additional equations may be required in International GCSE Physics papers 2P and 2PR.

1. Forces and Motion	
momentum = mass × velocity	$p = m \times v$
force = $\dfrac{\text{change in momentum}}{\text{time taken}}$	$F = \dfrac{(mv - mu)}{t}$
moment = force × perpendicular distance from the pivot	
5. Solids, liquids and gases	
change in thermal energy = mass × specific heat capacity × change in temperature	$\Delta Q = m \times c \times \Delta T$
6. Magnetism and electromagnetism	
relationship between input and output voltages for a transformer	$\dfrac{\text{input (primary) voltage}}{\text{output (secondary) voltage}} = \dfrac{\text{primary turns}}{\text{secondary turns}}$
input power = output power	$V_p I_p = V_s I_s$ for 100% efficiency
8. Astrophysics	
$\dfrac{\text{change in wavelength}}{\text{reference wavelength}} = \dfrac{\text{velocity of a galaxy}}{\text{speed of light}}$	$\dfrac{\lambda - \lambda_0}{\lambda_0} = \dfrac{\Delta\lambda}{\lambda_0} = \dfrac{v}{c}$

END OF EQUATION LIST