Topical Past Paper Questions Workbook

Edexcel International GCSE Physics (4PH1) Paper 2P & 2PR

Exam Series: Jan 2017 – Jun 2022

Format Type B:
Each question is followed by its answer scheme

EXAMINENT.COM
Eminent Exam Preparation Resources

Introduction

Each Topical Past Paper Questions Workbook contains a comprehensive collection of hundreds of questions and corresponding answer schemes, presented in worksheet format. The questions are carefully arranged according to their respective chapters and topics, which align with the latest IGCSE or A Level subject content. Here are the key features of these workbooks:

1. The workbook covers a wide range of topics, which are organized according to the latest syllabus content for Cambridge IGCSE or AS/A Level exams.
2. Each topic includes numerous questions, allowing students to practice and reinforce their understanding of key concepts and skills.
3. The questions are accompanied by detailed answer schemes, which provide clear explanations and guidance for students to improve their performance.
4. The workbook's format is user-friendly, with worksheets that are easy to read and navigate.
5. This workbook is an ideal resource for students who want to familiarize themselves with the types of questions that may appear in their exams and to develop their problem-solving and analytical skills.

Overall, Topical Past Paper Questions Workbooks are a valuable tool for students preparing for IGCSE or AS/A Level exams, providing them with the opportunity to practice and refine their knowledge and skills in a structured and comprehensive manner. To provide a clearer description of this book's specifications, here are some key details:

- Title: Edexcel IGCSE Physics (4PH1) Paper 2P & 2PR Topical Past Papers
- Subtitle: Exam Practice Worksheets With Answer Scheme
- Examination board: Pearson Edexcel
- Subject code: 4PH1
- Years covered: Jan 2017 – Jun 2022
- Paper: 2P and 2PR
- Number of pages: 500
- Number of questions: 156

Contents

WWW.EXAMINENT.COM
EXAMINENT Eminent Exam Preparation Resources

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

Chapter 1

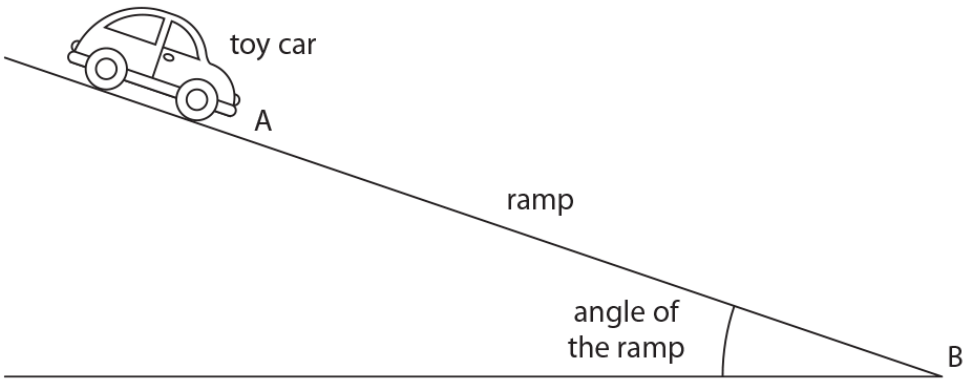
Forces and motion

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

1.1 Movement and position

1. 4PH0_2P_que_20180616 Q: 3

A student uses this apparatus to investigate how the angle of a ramp affects the time taken for a toy car to travel down the ramp.



This is the student's method.

- set the angle of the ramp to 10° and measure the time for the car to travel from A to B
- repeat the experiment for five different angles, using the same car travelling from A to B

(a) The table lists some variables in this investigation.

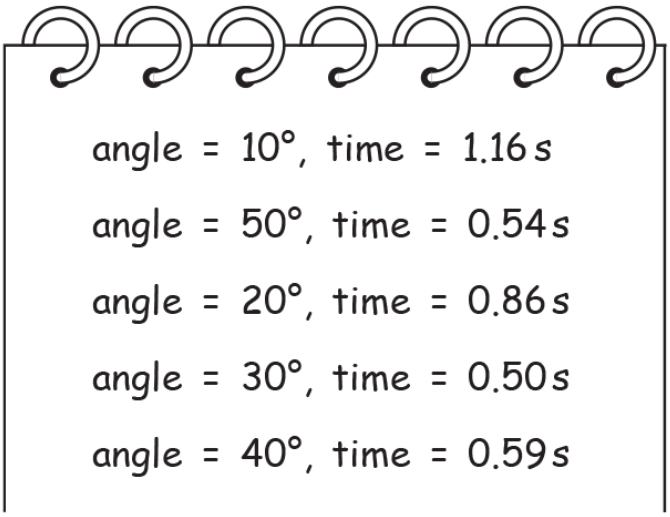
Place one tick (✓) in each row to show the independent, dependent and control variables.

(4)

	Independent variable	Dependent variable	Control variable
Type of toy car			
Time to travel from A to B			
Angle of ramp			
Distance travelled down ramp			

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

(b) These are the student's results.

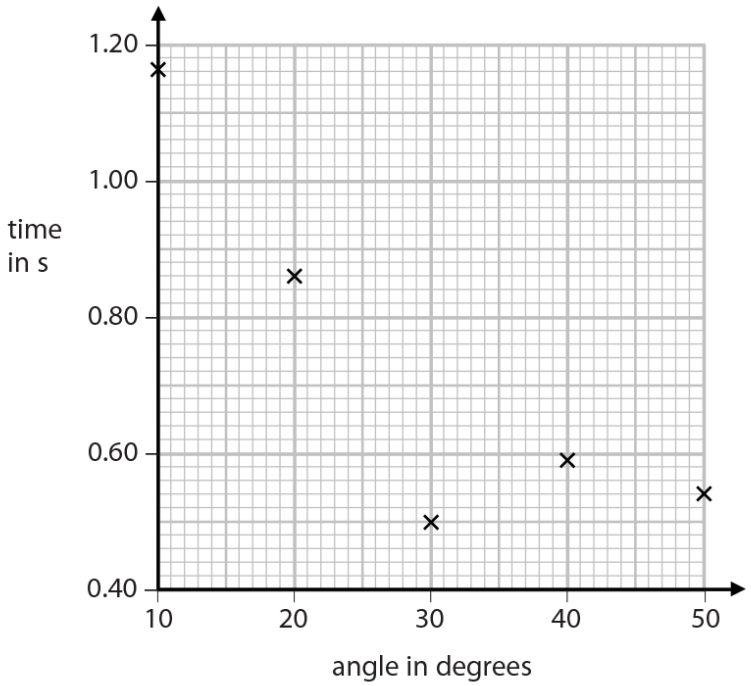


Draw a table of the student's results.

(3)

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

(c) The graph shows the results of the student's investigation.



(i) Circle the anomalous point on the graph.

(1)

(ii) Suggest how the student should deal with the anomalous result.

(1)

.....

.....

(iii) Draw the curve of best fit on the graph.

(1)

(iv) Suggest why the student did not start either axis from zero.

(1)

.....

.....

(Total for Question 3 = 11 marks)

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

Answer:

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>a</td><td>one mark for each correct row;;;;
<table><tr><th></th><th>Independent variable</th><th>Dependent variable</th><th>Control variable</th></tr><tr><td>Type of toy car</td><td></td><td></td><td>✓</td></tr><tr><td>Time to travel from A to B</td><td></td><td>✓</td><td></td></tr><tr><td>Angle of ramp</td><td>✓</td><td></td><td></td></tr><tr><td>Distance travelled down ramp</td><td></td><td></td><td>✓</td></tr></table></td><td>do not award each mark if two or more ticks in same row</td><td>4</td></tr>
<tr><td>b</td><td>only two columns/rows with headings of ‘angle’ and ‘time’;

correct units included in both headings;

data for angles given in ascending/descending order and all data given to same precision as in the paper;</td><td>ignore third column/row for numbering tests
columns/rows can be in either order
reject if any units given with data values
ignore abbreviations for units e.g. ‘deg’, ‘secs’
units can be given in words or symbols and written in brackets, separated using / or written as e.g. ‘time in s’</td><td>3</td></tr>
</table>

WWW.EXAMINENT.COM
EXAMINENT Eminent Exam Preparation Resources

Question number	Answer	Notes	Marks
c (i)	point circled at (30,0.50);		1
(ii)	any one from: MP1. ignore it (in calculations / drawing curve); MP2. repeat it;	allow exclude it, discard it ignore 'repeat the (whole) experiment'	1
(iii)	smooth curve passing within 1 square of all points except for (30,0.50);		1
(iv)	any one from: MP1. makes better use of the grid; MP2. time would never be zero; MP3. ramp would be flat / car would not move; MP4. no results taken below 10°/ 0.50 s;	allow 'no results at zero'	1

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

1.2 Forces, movement, shape and momentum

2. 4PH0_2PR_que_20170616 Q: 6

(a) A student measures the weight of a cannonball as 50 N.

(i) Name a piece of equipment he could use to measure the weight.

(1)

.....

(ii) State the equation relating weight, mass and *g*.

(1)

(iii) Calculate the mass of the cannonball.

(2)

mass = ... kg

(b) Describe how the student could find the density of the cannonball.

You should include details of any further measurements he would need to make.

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

WWW.EXAMINENT.COM
EXAMINENT Eminent Exam Preparation Resources

(c) A cannonball is fired from a cannon.

When the cannonball is fired, the cannon moves in the opposite direction, as shown in the diagram.

Using ideas about momentum, explain why the cannon moves in the opposite direction to the cannonball.

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 6 = 10 marks)

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

Answer:

Question number	Answer	Notes	Marks
(a) (i)	any sensible suggestion; e.g. newtonmeter / balance / scale(s)	 accept (electronic) scale condone newtonmetre ignore weighing machine	1
(ii)	weight = mass x gravitational field strength;	allow in standard symbols or in words e.g. W = m x g allow a 'mixture' e.g. weight = mass x g reject 'gravity' for g	1
(iii)	substitution OR rearrangement; evaluation; e.g. 50 = m x 10 (m =) 5 (kg)	 allow use of g = 9.81 N/kg 5.1(kg) from g= 9.81 accept correct answer with no working for both marks	2
(b)	MP1. use of density = mass/volume; MP2. measure volume (of cannonball); MP3. further volume measurement detail; e.g. volume of cannonball= volume of water displaced OR measure diameter AND calculate volume of sphere	 allow 'find out' for measure allow radius for diameter $v=4/3\ \pi\ r^3$ for volume	3
(c)	any 3 of: MP1. Momentum = mass x velocity; MP2. momentum before (firing) is zero; MP3. momentum is conserved; MP4. idea that after firing cannon must have equal and opposite momentum to cannonball;	ignore references to Newton's laws p = m x v momentum before = momentum after $0 = m_1 \times v_1 - m_2 \times v_2$ (v taken in the direction of the arrows on the diagram)	3

WWW.EXAMINENT.COM
EXAMINENT Eminent Exam Preparation Resources

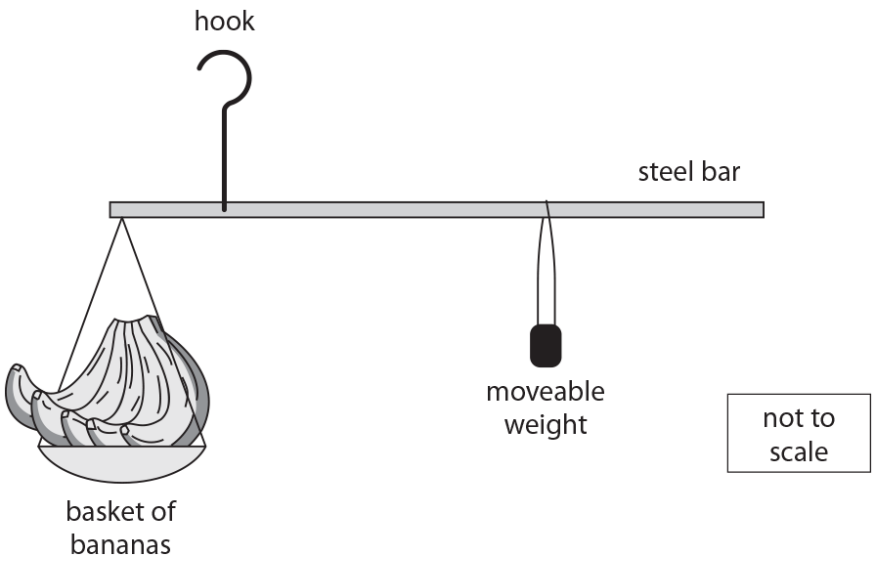
3. 4PH0_2PR_que_20180616 Q: 7

The photograph shows a fruit seller using a yard-arm to weigh fruit.

The yard-arm consists of a steel bar about 1 m long, with a basket at one end and a moveable weight at the other end.

It is held up by a hook which is fixed to the bar close to the basket.

The diagram shows a yard-arm being used to find the weight of five bananas.



(a) Draw an X on the diagram to show the pivot point.

(1)

(b) State the principle of moments.

(1)

.....

.....

.....

.....

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

(c) The support for the basket is 14.1 cm from the pivot.

The moveable weight is 84.6 cm from the pivot and weighs 1.25 N.

Calculate the weight of the five bananas.

[ignore weight of steel rod and basket]

(3)

weight of five bananas = ... N

(d) Calculate the mass in grams of one banana.

(3)

mass of one banana= ..... g

(e) Suggest two ways that the fruit seller could alter his yard-arm so that he could measure larger weights.

(2)

1 .....

.....

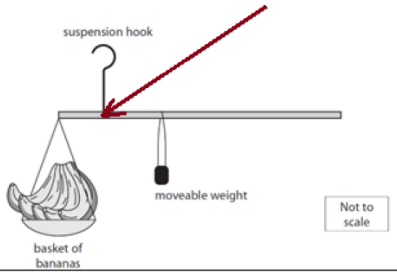
2 .....

.....

(Total for Question 7 = 10 marks)

WWW.EXAMINENT.COM
EXAMINENT Eminent Exam Preparation Resources

Answer:

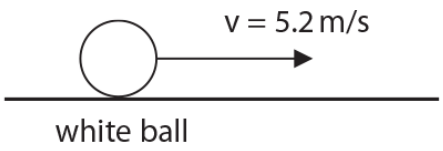
Question number	Answer	Notes	Marks
(a)	X marked at the point of suspension;  	allow cross in line with hook but just above or below bar	1
(b)	(at equilibrium, sum of) moment(s) anticlockwise = (sum of) moment(s) clockwise;		1
(c)	substitution into principle of moments; rearrangement; evaluation; e.g. $14.1 \times$ weight of bananas $= 84.6 \times 1.25$ (weight of bananas =) $\frac{84.6 \times 1.25}{14.1}$ (weight of bananas =) 7.5 (N)	allow cm or m for distance units -1 if POT error	3
(d)	finding weight of one banana; conversion from weight to mass in kg; conversion to g from kg; e.g. weight of one banana = 7.5 ÷ 5 (= 1.5 N) mass = (1.5 ÷ 10 =) 0.15 kg (mass =) 150 (g)	allow ECF answer from (c) ÷ 5 allow use of g = 9.8, 9.81 allow 0.153… allow 153	3
(e)	any two from: MP1. use a yard-arm with a longer distance for the small weight to move along/eq; MP2. smaller distance from pivot to basket; MP3. heavier (moveable) weight;	ignore solutions involving adding another basket allow use a longer yard-arm / steel bar hook to basket allow larger (moveable) weight	2

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

4. 4PH1_2PR_que_20190615 Q: 7

A game is played on a table with balls of different colours.

(a) The diagram shows the white ball moving across a flat surface.



(i) State the formula linking momentum, mass and velocity.

(1)

(ii) The white ball has a mass of 170 g.

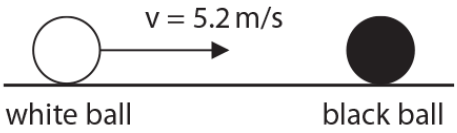
Calculate the momentum of the white ball.

(2)

momentum = ... kg m/s

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

(b) The white ball collides with a stationary black ball.



before collision

after collision

(i) The black ball has a mass of 160 g.

After the collision, the black ball moves away from the white ball with a velocity of 5.0 m/s.

Calculate the velocity of the white ball after the collision.

(4)

velocity of white ball = ... m/s

(ii) During the collision, the white ball exerts a force of 80 N on the black ball.

The direction of this force is to the right.

State the magnitude and direction of the force the black ball exerts on the white ball during the collision.

(2)

magnitude of force = ... N

direction of force = ...

(Total for Question 7 = 9 marks)

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

Answer:

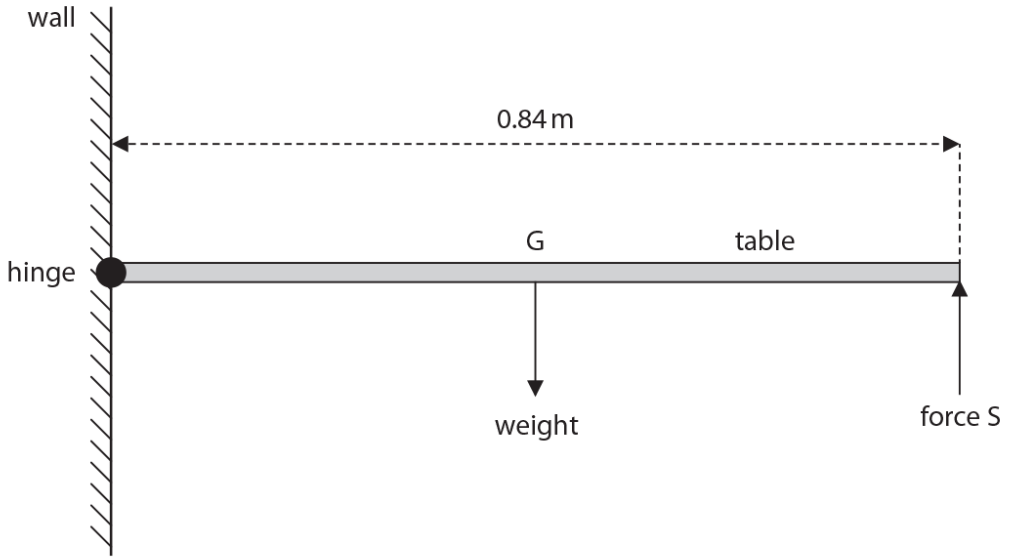
Question number	Answer	Notes	Marks
(a) (i)	momentum = mass × velocity;	allow rearrangements and standard symbols e.g. m = p / v reject m for momentum	1
(ii)	substitution; evaluation; e.g. (p =) 0.170 × 5.2 (p =) 0.88 (kgm/s)	-1 if POT error allow 0.884 (kgm/s)	2
(b) (i)	momentum of black ball calculated; conservation of momentum used correctly; final momentum of white ball calculated; evaluation of final velocity of white ball; e.g. p_{black} = 0.80 (kgm/s) 0.88 = p_{white} + 0.80 p_{white} = 0.08 (kgm/s) v_{white} = 0.47 (m/s)	ignore units stated or implied from calculation allow ecf from (a) ignore units allow 800 (gm/s) allow 80 (gm/s) allow 0.5, 0.4705... 0.49 for use of 0.884 from a(ii)	4
(ii)	80 (N); (to the) left;		2

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

5. 4PH1_2PR_que_20200305 Q: 2

This question is about a folding table.

The diagram shows some of the forces acting on the table.



(a) The weight of the table acts through point G.

State the name of point G.

(1)

.....

(b) State the formula linking moment, force and perpendicular distance from the pivot.

(1)

(c) The moment of the weight force of the table about the hinge is 92 N m.

By using the principle of moments, calculate the force S that a person applies to keep the table in equilibrium.

(3)

force S = ... N

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

(d) State Newton's third law.

(1)

.....

.....

.....

.....

(e) State the magnitude and the direction of the force that the table applies to the person holding the table.

(2)

magnitude = ... N

direction = ...

(Total for Question 2 = 8 marks)

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources

Answer:

Question number	Answer	Notes	Marks
(a)	centre of gravity;	accept centre of mass	1
(b)	moment = force × (perpendicular) distance;	allow standard symbols and rearrangements e.g. M = F × d allow d, s, x for distance	1
(c)	substitution; rearrangement; evaluation; e.g. 92 = F_s × 0.84 F_s = 92 / 0.84 (F_s =) 110 (N)	 -1 for POT error 2 marks max. if incorrect distance used e.g. 0.42 m giving answer of 219 (N) allow 109.5, 109.52…	3
(d)	idea that every force has an equal and opposite reaction;	however expressed allow “action” for force	1
(e)	same value as (c); down;	allow ecf from (c) expected answer is 110 (N)	2

WWW.EXAMINENT.COM
EXAMINENT
Eminent Exam Preparation Resources