



*Rewarding Learning*

**General Certificate of Secondary Education  
2025**

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## **Physics**

**Practical Skills Assessment**

**Unit 3**

**Booklet B**

**Higher Tier**

**[GPY34]**

**MONDAY 23 JUNE, MORNING**

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# **MARK SCHEME**

## General Marking Instructions

### **Introduction**

Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses.

### **Assessment objectives**

Below are the assessment objectives for GCSE Physics

Candidates must:

- AO1** Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures;
- AO2** Apply knowledge and understanding of scientific ideas, scientific enquiry, techniques and procedures; and
- AO3** Analyse information and ideas to interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures.

### **Quality of candidates' responses**

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 16-year-old which is the age at which the majority of candidates sit their GCSE examinations.

### **Flexibility in marking**

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

### **Positive marking**

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 16-year-old GCSE candidate.

### **Awarding zero marks**

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

### **Marking Calculations**

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error.

### **Types of mark schemes**

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

Other questions which require only short answers are marked on a point for point basis with marks awarded for each valid piece of information provided.

### **Levels of response**

Tasks and questions requiring candidates to respond in extended writing are marked in terms of levels of response. In deciding which level of response to award, examiners should look for the 'best fit' bearing in mind that weakness in one area may be compensated for by strength in another. In deciding which mark within a particular level to award to any response, examiners are expected to use their professional judgement. The following guidance is provided to assist examiners.

- **Threshold performance:** Response which just merits inclusion in the level and should be awarded a mark at or near the bottom of the range.
- **Intermediate performance:** Response which clearly merits inclusion in the level and should be awarded a mark at or near the middle of the range.
- **High performance:** Response which fully satisfies the level description and should be awarded a mark at or near the top of the range.

### **Quality of written communication**

Quality of written communication (QWC) is taken into account in assessing candidates' responses to all tasks and questions that require them to respond in extended written form.

These tasks and questions are marked on the basis of levels of response. The description for each level of response includes reference to the quality of written communication.

For conciseness, quality of written communication is distinguished within levels of response as follows:

Level A: Quality of written communication is excellent.

Level B: Quality of written communication is good.

Level C: Quality of written communication is basic.

In interpreting these level descriptions, examiners should refer to the more detailed guidance provided below:

**Level A (Excellent):** The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation and spelling, punctuation and grammar (SPG) are of a sufficiently high standard to make meaning clear.

**Level B (Good):** The candidate makes a reasonable selection and use of an appropriate form and style of writing. Relevant material is organised with some clarity and coherence. There is some use of appropriate specialist vocabulary. Presentation and spelling, punctuation and grammar (SPG) are sufficiently competent to make meaning clear.

**Level C (Basic):** The candidate makes only a limited selection and use of an appropriate form and style of writing. The organisation of material may lack clarity and coherence. There is little use of specialist vocabulary. Presentation and spelling, punctuation and grammar (SPG) may be such that intended meaning is not clear.

**Where one response is required to gain a mark, candidates will not gain credit if a correct response is given alongside one or more incorrect responses. This is referred to as listing.**

- 1 (a) (i) Velocity of part A =  $\frac{0.03}{0.3} = 0.1$  (m/s) [1]
- (ii) Velocity of part B =  $\frac{0.03}{0.2} = 0.15$  (m/s) [1]
- (iii) Acceleration (rate of change of speed) =  $\frac{(0.15 - 0.1)}{0.25} = \frac{0.05}{0.25}$  [1]  
 = 0.2 (m/s<sup>2</sup>) [1] [2]

ecf from (i) and (ii)

(iv)

Mass/kg	1/mass/ 1/kg	Acceleration/ m/s <sup>2</sup>
0.4	2.5	12.5
0.5	2.0	10.0
0.6	1.7	8.3
0.7	1.4	7.1
0.8	1.3	6.3

[1]

- (v) Labels with units on both axes [2]  
 Scale [1]  
 Points correctly plotted  $5 \times [\frac{1}{2}]$  each round down [2]  
 Best fit line through (0, 0) [1] [6]

- (vi)  $F = \frac{a}{\frac{1}{\text{mass}}}$  [1]  
 =  $\frac{10}{2}$  or values from their line [1]  
 = 5(N) [1] [3]

- (b) (i) **Measure** the time to move from one marking to the next [1]  
 The timings should be **the same**. [1] [2]
- (ii) Labelled arrows friction up weight down [1]
- (iii) They are equal/balanced [1]

- 2 (a) (i) Clamp motor to bench [1]
- (ii) Use  $W = mg$  or indicate 100g has weight of 1 N  
must indicate mass in kg [1]
- (iii) Stop watch/stop clock/timer [1]
- (b) (i) Units See table below: N, m, s ([1] each) [3]
- (ii) Load force = 1.5(0) [1]

Mass/g	Load Force/ <b>N</b>	Distance load lifted/ <b>m</b>	Work/ <b>J</b>	Time taken/ <b>s</b>	Power/ <b>W</b>
150	<b>1.5</b>	0.50	<b>0.8</b>	0.41	<b>2.0</b>
150	<b>1.5</b>	0.60	<b>0.9</b>	0.46	<b>2.0</b>
150	<b>1.5</b>	0.75	<b>1.1</b>	0.61	<b>1.8</b>
150	<b>1.5</b>	1.10	<b>1.7</b>	0.90	<b>1.9</b>
150	<b>1.5</b>	1.25	<b>1.9</b>	1.18	<b>1.6</b>

- (iii) See table above:  
Heading Work/J (accept Nm) [1]  
**0.8 0.9 1.1 1.7 1.9** [ $\frac{1}{2}$ ] each round down [2]  
All values to 1 decimal place [1] [4]  
ecf from (b)(ii)
- (iv) See table above  
Heading Power/W or watts or joules per second or J/s [1]  
**2.0 2.0 1.8 1.9 1.6** [ $\frac{1}{2}$ ] each round down [2]  
All values to 1 decimal place [1] [4]  
ecf from (b)(iii)
- (v) Average =  $\frac{(2.0 + 2.0 + 1.8 + 1.9 + 1.6)}{5} = \frac{9.3}{5}$  [1]  
= 1.9 (W) or 1.86 [1] [2]  
ecf from (b)(iv)

AVAILABLE  
MARKS

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				AVAILABLE MARKS	
3	(a) (i)	Ammeter in series	[1]		
		Voltmeter in parallel	[1]		
		Switch in series	[1]		
		Bulb in parallel	[1]		
		Variable resistor in series	[1]	[5]	
	(ii)	Voltmeter reading = 2.6 (V)	[1]		
		Ammeter reading = 1.3 (A)	[1]		
		Resistance = $\frac{2.6}{1.3}$ = 2.0 ( $\Omega$ )	[1]	[4]	
	(b) (i)	Power values <b>0.2 0.7 1.8 4.0 7.5</b> [ $\frac{1}{2}$ ] each round down not to 1d.p. deduct 1		[2]	
		(ii)	Labels on both axes	[1]	
x-axis: Power/W					
y-axis: Voltage/V					
Points [ $\frac{1}{2}$ ] each round down			[3]		
Smooth curve		[1]	[5]		
(iii)	Not proportional (threshold)	[1]			
	The graph is a curve/is not a straight line through (0,0)	[1]	[2]		
4	(a) (i)	Points [ $\frac{1}{2}$ ] each round down	[2]		
		Labels quantity with unit on both axes	[2]		
		x-axis: Current/A			
		y-axis: Newton meter reading/N			
		Best fit line	[1]	[5]	
	(ii)	Intercept on y-axis	[1]		
		Weight of the iron = 1.0(N) or their intercept	[1]	[2]	
	(b) (i)	Repeat and average the measurements		[1]	
		(ii)	$0.4^2 = k \times 0.1$ <b>or</b> $k = \frac{0.16}{0.1}$	[1]	
			$k = 1.6$	[1]	
Unit = volt <sup>2</sup> /m <b>or</b> V <sup>2</sup> /m			[1]	[3]	
(iii)		Dependent variable – (induced) voltage	[1]		
		(The one that is being) measured	[1]		
		Independent variable – height (dropped)	[1]		
		(The one that is being) changed or altered (on purpose)	[1]		
Control variable – (strength of the) magnet/ number of turns/coils	[1]				
	(The one that is) unchanged or the same	[1]	[6]		
			<b>Total</b>	<b>70</b>	