CCEA
Rewarding Learning

General Certificate of Secondary Education
2019

Physics

Practical Skills Assessment
Unit 3
Booklet A

Higher Tier

[GPY33]

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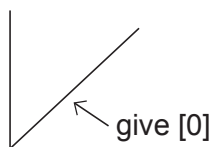
Level A (Excellent): The candidate successfully selects and uses the most appropriate form and style of writing. Relevant material is organised with a high degree of clarity and coherence. There is widespread and accurate use of appropriate specialist vocabulary. Presentation and spelling, punctuation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

Experiment 1

Step 1   Columns 1 to 3 with headings and units
         At least one column
         t/s or T/s
         Time/s or Time(s) or Time in s   [1]
         Three times for all 5 distances   [1]
         All values to 2 dp   [1]
         Units in spaces – no credit

Step 2   Column 4 headed **Average** time/s or t/s or as above   [1]
         Average time calculated **for all** distances   [1]
         ignore dp

Step 3   Column 5 headed **Average velocity/cm/s** – award m/s if consistent
         with data
         not speed   [1]
         Average velocity calculated for **all** distances   [1]
         ignore dp

Step 4   Column 6 headed **final velocity**/cm/s or in m/s if consistent with data   [1]
         Final velocity calculated for **all** distances   [1]
         ignore dp

1   Graph
         X axis labelled **time/s**
         Average not required
         t/s etc as above   [1]

         Y axis labelled (final) **velocity**/cm/s
         speed – no   accept m/s   [1]

         At **least three points** correctly plotted
         ±1 div
         use dots and 1 tick   [1]

         Line of best fit – not joining dots
         through 0, 0 – not required   give [0]   [1]

         Poor scale i.e. less than half of grid used penalty 1 mark
         Discontinuous scale [–1]   transposed axes [–1]

2   Value of a calculated from the gradient or 1 point from their line if graph
         through 0, 0
         not using values from table
         Allow value of gradient from transposed graph if consistent   [1]

         Unit cm/s^2 or m/s^2 consistent with graph   [1]   15

Experiment 2

Step 1   Completion of the circuit

Check the front cover, if the box is ticked award [3]   [3]

If not ticked award [0]

Step 2   Columns headed **voltage**/V and **current**/A or V/V or I/A or pd/V
Phy Q'ty + unit   [1]

Step 3   5 sets of voltage and current [2]   [3]

(3 sets of voltage and current award [1])
1 dp in all results [1]

1   Graph

Y axis labelled Voltage/V   [1]

X axis labelled current/A   [1]

At **least 3 points** correctly plotted
Transposed axes [–1] Poor scale [–1]   [1]

2   Line of best fit   [1]

Joining the points with lines give [0]

3   Resistance calculated at 2.0 V ⎫
and   ⎬ ignore dps
Resistance calculated at 4.0 V ⎭   [2]
Use of $R = \dfrac{V}{I}$ give [1] – part credit

4   Part A No change
temperature has remained constant
or
Part B Change
temperature has increased/changed – **not** decreased   [1]

5   First graph ticked   [1]   15

                                                                  Total   **30**