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# **Examiners' Report/ Principal Examiner Feedback**

## Summer 2017

Pearson Edexcel GCSE  
In Physics (5PH1H) Paper 01

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## **Paper Introduction**

The unit was divided into six topics and all six topics were tested in the examination. It was intended that the examination paper would allow every candidate to show what they knew, understood and were able to do. To achieve this, each question increased in difficulty as the questions progressed.

Within the question paper, a variety of question types were included, such as objective questions, short answer questions worth one or two marks each and longer questions worth three or four marks each. The two six mark questions were used to test quality of written communication (QWC).

It was encouraging to note the positive way in which the vast majority of candidates approached the paper, particularly in the six mark questions.

### **5PH1H\_01\_Q01aii**

#### Question Introduction

Examiners were looking for the idea that the focal length is the image distance when the object is a long way away. This would be based on practical work with converging lenses.

### **5PH1H\_01\_Q01aiii**

#### Question Introduction

Here examiners were looking for an image distance corresponding to a large object distance.

The range of acceptable values was 12 to 16 cm (or 0.12 to 0.16 m).

### **5PH1H\_01\_Q01b**

#### Question Introduction

The first mark was for noting that a reflecting telescope uses a converging mirror. (An alternative to this was 'using a mirror instead of a lens').

The second mark was for noting that the (converging) mirror is used as the objective. (An alternative to this was 'to collect the light').

### **5PH1H\_01\_Q01c**

#### Question Introduction

Here examiners were looking for a relevant improvement or invention for the first mark and an explanation as to how it improved things.

#### Examiner Comment

The improvement is putting telescopes in space with a good explanation of how this has allowed scientists to observe the Universe in more detail.

### **5PH1H\_01\_Q02a**

#### Question Introduction

### **5PH1H\_01\_Q02b**

#### Question Introduction

Both graphs show changes in the magnitude of the current but only graph P shows a change in direction (positive and negative current).

#### Examiner Comment

This response refers to the current in P changing from positive to negative and back again and the current in Q remaining positive

### **5PH1H\_01\_Q02c**

#### Question Introduction

### **5PH1H\_01\_Q02d**

#### Question Introduction

Before substituting and rearranging the equation, candidates had to correctly identify the coils.

#### Examiner Comment

Coils correctly identified, working clearly shown, leading to the correct numerical answer. 4 marks.

### **5PH1H\_01\_Q03aii**

#### Question Introduction

The most common error in this calculation was leaving the time in minutes

### **5PH1H\_01\_Q03aiii**

#### Question Introduction

This was a relatively straight forward calculation but it did involve rearranging an equation.

Clearly shown working helps candidates to process their answers and examiners to award intermediate marks if the final answer is not correct.

### **5PH1H\_01\_Q03bi**

#### Question Introduction

The first mark here was for the idea that energy is being radiated by the source.

The second mark was for the idea that this was at the same rate as the input.

#### Examiner Comment

'Energy radiated' would have been preferred to 'energy coming out' but this certainly has the idea that the input and output are at the same rate.

### **5PH1H\_01\_Q03bii**

#### Question Introduction

There was one mark here for saying that the temperature would decrease and the other mark was for the temperature reaching a (lower) constant value.

### **5PH1H\_01\_Q04b**

#### Question Introduction

Both marks could be scored here by saying that Gamma rays were emitted all the time or randomly from radioactive sources or during radioactive decay.

#### Examiner Comment

This scores both marks by referring to radioactive sources and decay.

### **5PH1H\_01\_Q04c**

#### Question Introduction

### **5PH1H\_01\_Q04d**

#### Question Introduction

This calculation involved rearranging an equation and working with numbers in standard form.

The correct numerical answer would score all 3 marks, even without the working but clear working had to be seen for the award of intermediate marks if the correct numerical answer was not obtained.

### **5PH1H\_01\_Q05ai**

#### Question Introduction

In this description of the term 'Red Giant', candidates had to make reference to the fact that this is a stage in the life cycle of a star and give some information to define its position in the cycle.

#### Examiner Comment

This response is brief and accurate and scores both marks by saying it is the next stage after Main Sequence.

### **5PH1H\_01\_Q05aii**

#### Question Introduction

Full marks could be scored here for reference to the increase in the observed wavelength of light from a galaxy or star moving away from the observer.

## **5PH1H\_01\_Q05b**

### Question Introduction

A difficult question where candidates had to make decisions about the data to be substituted into an unfamiliar equation that was given to them.

Their mathematical skills were tested in working with standard form and cancelling unfamiliar units.

Many were able to score at least 1 mark with a pleasing number scoring both.

## **5PH1H\_01\_Q05c**

### Question Introduction

Candidates were asked to compare the Big Bang theory with the Steady State theory and discuss the evidence which has led scientists to reject the Steady State theory.

Examiners were looking for a similarity and a difference between the two theories with a reference to Cosmic Microwave Background Radiation being the evidence which led to the rejection of the Steady State theory.

### Examiner Comment

The similarity is that both theories include the expanding Universe and the difference is the way the theories have the origin of the universe. CMBR is cited as the evidence for rejecting Steady State.

### Examiner Tip

The word 'compare' in a question is usually looking for a similarity and a difference.

### **5PH1H\_01\_Q06a**

#### Question Introduction

### **5PH1H\_01\_Q06a**

#### Question Introduction

The important ideas here were that the frequency of the waves used by elephants was below the range of human hearing.

### **5PH1H\_01\_Q06c**

#### Question Introduction

To reach level 3 in this item, candidates had to analyse and evaluate some information about how earthquakes were located some time ago. The key was to appreciate that this was triangulation of direction. They had to use their knowledge about triangulation of distance and apply it to this unfamiliar situation to show how the data in the diagram could be used to find where the earthquake occurred.

### **Paper Summary**

Based on their performance on this paper, candidates are offered the following advice:

Make sure that they have a sound knowledge of the fundamental ideas in all six topics.

Get used to the idea of applying their knowledge to new situations by attempting questions in support materials or previous examination papers.

Show their working at each stage of a calculation, particularly in complex calculations or those involving transposing an equation.

Use the marks at the side of a question as a guide to the form and content of their answer.

Avoid repeating the question in their answer.