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Examiners' Report
October 2025

Pearson Edexcel International Advanced Level In Physics
WPH15/01

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October 2025
Question Paper Log Number P78835A
Publication Code WPH15_01_2510_ER
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Introduction

The assessment structure of WPH15 mirrors that of WPH14. It consists of 10 multiple choice questions, a number of short answer questions and some longer, less structured questions.

As it is an A2 assessment unit, synoptic elements are incorporated into this paper. There is overlap with circular motion and exponential variation in Unit 4 but also overlap with some of the AS content from Units 1 and 2.

The paper includes the use of specific command words as detailed in the specification, Appendix 9: Taxonomy. It is recommended that centres ensure that their students understand what is required when responding to such questions. In this paper where the command word was deduced, evaluated, or assessed, the final mark could sometimes not be awarded on otherwise good responses because a final appropriate comment was missing.

Candidates should be encouraged to read questions carefully to ensure that their responses take into account all the relevant information. Section B questions are set in context. Candidates should be aware that the context of the physics in which the question is set and all supplementary information provided are required for a complete response that could gain full marks.

Sometimes candidates start their response by repeating the question. This may mean that they struggle to get all of the relevant points in the space provided.

Candidates should be encouraged to consider the number of marks available for a question, and to use this to inform their response. If candidates either need more space or want to replace an answer, they should indicate clearly where that response is to be found.

Candidates should be encouraged to work with mark schemes in preparation for their exam. However, it is important that they understand that mark schemes do not provide model answers to questions. Mark schemes are written for examiners, and so sometimes refer to what examiners expect to see rather than giving a complete answer.

SECTION A: Multiple Choice Questions

In general candidates' performance in this section of the paper was similar to candidates' performance in previous series.

SECTION B: Extended Response Questions

Q11

This question was generally well answered. A common error seen was to misunderstand "40% greater" and to multiply the radius of the Earth by a factor of 0.4 rather than by a factor of 1.4

Q12

This question was well answered. Most responses used the Doppler shift equation correctly. Some responses included a separate calculation of red shift followed by use of the value of the red shift to calculate the velocity. Both approaches were able to score full marks.

Q13(a)

Most responses scored well on this item. In some responses, the algebra to show how the required expression was obtained from the gravitational potential expression was unclear.

Q13(b)

The best responses seen scored both marks without issues. However, a number of candidates were unsure what to substitute for the velocity and so missed out on marks.

Q14

This question was well answered, with many clear, logical solutions to the problem. Some candidates omitted to convert temperatures to kelvin. Others did not use the correct equation for the volume of a sphere. Candidates should be aware that mathematical expressions for areas and volumes are not provided, and so these must be memorised.

Q15(a)(i)-(ii)

This question relied upon an understanding of the conditions for simple harmonic motion. Part (i) was well answered. In part (ii) a number of responses stated that the minus sign meant 'towards the equilibrium position'. Although this is fine for the definition of simple harmonic motion it does not answer the question as stated here. The best responses stated that the minus sign means that the resultant force is in the opposite direction to the displacement.

Q15(a)(iii)

This calculation was generally well performed, with most candidates able to arrive at a correct final answer. Some candidates doubled the displacement and used twice the amplitude in their calculation. This led to a final answer four times the correct value.

Q15(b)

Many carefully drawn graphs were seen. The phase relationship was usually correct. Common reasons for missing out on marks other than the phase relationship being incorrect included not matching the time period to that of the acceleration and drawing a non-sinusoidal shaped graph.

Q16(a)

The extended calculation in (a) was well answered by many candidates. As the question asks for the manufacturer's claim to be evaluated, a conclusion including a comparison of values is required for full marks to be gained. In (b) most candidates were correctly able to relate the time taken for the colour to change to the rate at which the temperature decreases.

Q17(a)

For most candidates this was a straightforward balancing of a nuclear equation. Occasionally the mass and atomic numbers (nucleon and proton numbers) of a beta particle were misremembered or confused. Those candidates who had correct values for Z and A for the beta particle sometimes struggled to deal with the −1 correctly.

Q17(b)

Both parts were generally well answered. In part (i) some candidates tried to use the exponential decay equation. Part (ii) required a deduction, and so a conclusion with a comparison of values was expected.

Q18(a)

Most candidates were familiar with the features of a Hertzsprung-Russell diagram. The logarithmic nature of the temperature scale was indicated correctly by most candidates. Similarly, the vast majority of responses seen includes a reverse scale for temperature. A minority of responses omitted a unit for the temperature axis.

Q18(b)(i)

This question required an evaluation of a claim to be made, and so a conclusion with a comparison of values was expected. This was given by most candidates. Common ways in which candidates missed out on marks included using an incorrect expression for the surface area of a sphere and forgetting to raise T to the correct power. The correct ratio of radii is 24. To gain the final mark a comparison and a consistent conclusion was required.It was equally acceptable to state that "$24 \approx 25$, and so the claim is accurate", or "$24 < 25$, and so the claim is inaccurate".

Q18(b)(ii)

In general, candidates knew where Arcturus would be located. Expressing this clearly in relation to the position of the Sun was often not communicated effectively.

Q19(a)

This question is synoptic and relies upon an understanding of upthrust from unit 2 for full credit to be obtained. It was clear that many candidates had an incomplete recollection of the detail regarding upthrust. This limited the marks available for many candidates.

Q19(b)

This question assesses candidates' ability to construct a coherent and logical answer. In this case the context is reasonably familiar, and so candidates should have been able to produce good responses to the question. The question refers to some helium escaping and then asking candidates to explain what happens to the volume of the balloon after this. However, a number of candidates were confused by this and started their explanation at the instant when helium is escaping, rather than after the helium has escaped from the balloon.

The usual confusion about what was colliding was seen. The use of atoms or molecules (as sated in the question) is preferred to particles. At this level, particles are electrons, protons etc., and so this term should be avoided when atoms or molecules are meant. Similarly. some responses referred to the collisions between the molecules, rather than the collisions the molecules make with the walls of the balloon. Some candidates stated that pressure increases without relating it to the force on the walls.

Q20(a)

This was generally well answered.

Q20(b)

Many correct responses were seen to part (i). Some candidates attempted a direct "conversion" from atomic mass units to MeV, although the constant for this is not supplied for this specification and can mean that a response missed out on a number of marks if the final answer is incorrect. Most candidates were able to use the values supplied/calculated with the graph to obtain an in-range value for the binding energy per nucleon for uranium-235 in part (ii).

Q21(a)

Trigonometric parallax is usually well described, but on this occasion many candidates omitted salient details e.g. the backdrop of distant stars that appear fixed, the 6-month interval, and the diameter of the Earth's orbit around the Sun.

Q21(b)

Item is generally well answered. In part (i) the woed 'small' was sometimes used on its own to describe a white dwarf star. Candidates should be careful to qualify this term i.e. to refer to small radius, or small volume or small surface area. Occasionally in part (ii) the equation $I = \frac{L}{4\pi d^2}$ was referred to without the symbols being defined.

Q21(c)(i)

This question was well answered by those candidates who had made it to the end of the paper. The answer to the calculation was usually correct, although sometimes candidates omitted to subtract the radius of the Earth.

Q21(c)(ii)

This question was poorly answered. It was thought that candidates would pick up on the idea of a standard candle which formed the basis of part (b). However, this was missed by most candidates, and it was rare to see this mark awarded.

Paper Summary

Based on their performance on this paper, candidates should:

- ensure they have a thorough knowledge of the physics for this unit.
- read the question carefully and answer what is asked.
- formulate a response that is consistent with the command word used in the question.
- be particularly careful to use appropriate scientific terminology in questions which ask for a description or explanation.
- include all substitutions and all stages in the working in 'show that' questions.