Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic : 14_Particle model

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Name of the Student:_____
Max. Marks : 27 Marks **Time : 27 Minutes**

Mark Schemes

Q1.

Question number	Answer	Mark
i	B decreases increases A is wrong because the volume of the bubble does not decrease C and D are wrong because the air pressure in the bubble does not increase	(1) AO1

Question number	Answer	Additional guidance	Mark
ii	**D** Pa A , B and C are wrong because they are all wrong units for pressure		(1) AO1

Question number	Answer	Additional guidance	Mark
iii	substitution (1) (V_2 =) $\frac{0.5 \times 3.3}{1.07}$ evaluation (1) (volume of the bubble =) 1.5	 any number that rounds to 1.5 (m/s) accept 1.54 award full marks for the correct answer without working	(2) AO2

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Q2.

Question Number	Answer	Acceptable answers	Mark
(i)	solid liquid	in either order plasma as an alternative to either.	**(2)**

Question Number	Answer	Acceptable answers	Mark
(ii)	**C** temperature of the gas measured in Kelvin		**(1)**

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Q3.

Question number	Answer	Additional guidance	Mark
(i)	An answer that combines the following points of application of knowledge and understanding to provide a logical description of a method: measure the length of the air column (1) use a rule or fixed scale (1) use volume = area x length (1)	 measure (/find known) area of tube	(3)

Question number	Indicative content	Mark
* (ii)	Answers will be credited according to the candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all of the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. **A02 (6 marks)** • particles in (constant / random) motion • collide with the glass / oil surface • exert a force on the glass /change in momentum • as volume increases, pressure decreases • collisions with glass less frequent • same number of collisions over larger area • same force over larger area • (means) lower pressure	(6)

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Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	The explanation attempts to link and apply knowledge and understanding of scientific ideas, flawed or simplistic connections are made in the context of the question (A02) Lines of reasoning are unsupported or unclear (A02)
Level 2	3–4	The explanation is mostly supported through linkage and application of knowledge and understanding of scientific ideas. Some logical connections made between elements in the context of the question. (A02) Lines of reasoning are mostly supported through the application of relevant evidence (A02)
Level 3	5–6	The explanation is supported throughout by linkage and application of knowledge and understanding of scientific ideas. Logical connections made between elements in the context of the question. (A02) Lines of reasoning are supported by sustained application of relevant evidence (A02)

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Q4.

Question number	Answer	Mark
	C vibrate about fixed positions move freely	**(1)**

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Q5.

Question number	Answer	Mark
	An answer that combines the following points to provide a plan: • put weights on the plunger to increase the pressure of the trapped air (1) • use scale on syringe to measure the volume of trapped air (1) • calculate the pressure from P = weight added/area of plunger (1) • compare the increase in pressure to the volume of trapped air (1)	**(4)**

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Q6.

Question number	Indicative content	Mark
*	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. **AO1 (strand 2) (6 marks)** Indicative content • measure the length and width of a strip with the ruler / a metre rule • measure the thickness of the strip with a more accurate device e.g. digital callipers OR place 5 (say) of the same strip on top of each other and measure their thickness with the ruler then ÷5 to calculate a single thickness [plus air gap] • measure the mass of a strip with an electronic balance • measure the mass of (say) 5 strips then ÷5 to calculate the mass of one of them • calculate the volume (= l x w x t) in m^3 and the mass in kg • use displacement can/measuring cylinder to find the volume • mass / volume to get density • check if it's near one of the teacher's two values of density given • if it's close / not so far off it's safe to assume that strip is of the identified material • repeat for the other strip • other repeat measurements	**(6)** **AO1**

AO targeting: AO1.2

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Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. (AO1) • Presents a description which is not logically ordered and with significant gaps. (AO1)
Level 2	3-4	• Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. (AO1) • Presents a description of the procedure that has a structure which is mostly clear, coherent and logical with minor steps missing. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. (AO1) • Presents a description that has a well-developed structure which is clear, coherent and logical. (AO1)

Summary for guidance

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Level	Mark	Additional Guidance	General additional guidance – the decision within levels e.g. - At each level, as well as content, the scientific coherency of what is stated will help place the answer at the top, or the bottom, of that level.
	0	No rewardable material.	
Level 1	1–2	Additional guidance Partially complete description of a suitable procedure with at least two measurements OR one measurement and another procedural point	Possible candidate responses measure the length measure the width of a strip measure the mass/weight of a strip e.g. repeat measurements
Level 2	3–4	Additional guidance Mostly complete description of a suitable procedure with at least three measurements and some description of processing the results.	Possible candidate responses As above with measure the thickness of the strip calculate the volume (= l x w x t) OR immerse in liquid to get volume
Level 3	5–6	Additional guidance Detailed description of a suitable procedure with all necessary measurements and a clear description of processing the results.	Possible candidate responses As above with extra detail e.g. measure the mass of (say) 5 strips then ÷5 to calculate the mass of one of them detail of obtaining volume by immersion use density =mass /volume check if density value obtained is near one of the teacher's two values

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