Name of the Student:_____

Max. Marks : 17 Marks **Time : 17 Minutes**

Mark Schemes

Q1.

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. **AO2 (6 marks)** • The bubbles get bigger • Molecules of gas in constant motion • Molecules widely spaced and moving randomly • Molecules impact on surface of bubble/liquid molecules • Average of impacts produces gas pressure • Pressure is due to rate at which gas particles collide with liquid molecules/bubble surface • Liquid pressure decreases as bubble rises • $P_1V_1 = P_2V_2$ • If pressure decreases, volume of bubble will increase/volume of bubble must increase to give a decrease in pressure • As volume increases, rate at which particles collide with surface of bubble decreases	**(6)**

Level	Mark	Descriptor
	0	No awardable content.
Level 1	1–2	The explanation attempts to link and apply knowledge and understanding of scientific ideas, flawed or simplistic connections made between elements in the context of the question. (AO2) Lines of reasoning are unsupported or unclear. (AO2)
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. (AO2) Lines of reasoning mostly supported through the application of relevant evidence. (AO2)
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. (AO2) Lines of reasoning are supported by sustained application of relevant evidence. (AO2)

Q2.

Question	Answer	Additional guidance	Mark
	an explanation linking: density of solid is greater (than density of liquid) (1) (because) distance between particles in solid is less (than distance between particles in liquid) (1)	 solids are dens**er** accept in solids, particles are clos**er** accept in solids, there are **more** particles per unit volume / particles are **more** (tightly) packed	**(2)** **AO1.1**

Q3.

Question number	Answer	Mark
	B hit the sides of the container more often Options A, C and D are incorrect associations	(1) AO1

Q4.

Question number	Answer	Additional guidance	Mark
	an explanation linking density of wood less (than that of water) (1) less (volume of) water displaced (than volume of wood) (1)	 allow wood floats / should be submerged allow wood absorbing water allow (idea of) incorrect volume reading allow (idea that) the volume cannot be measured this way	**(2)** **A02**

Q5.

Question	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 particles exerting pressure: • particles in (rapid) (random) motion/have high speed • particles move freely • particles collide • particles collide with the (walls of) the container • there is a change in momentum of the particles • producing a force on the walls • pressure = force/area OR P=F/A	**(6)** **AO1.1**
	effect of decreasing volume: • when volume decreases collisions increase • when volume decreases rate/frequency of collisions increases • force on walls increases so pressure increases • area of walls decreases • (P = F/A) (so) as area decreases pressure increases	

Level	Mark	Descriptor
	0	• No rewardable material.

Level 1	1-2	• Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3-4	• Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

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 isolated facts, statements from either section	Possible candidate responses particles are moving
Level 2	3–4	Additional guidance limited explanation of both sections OR detailed explanation of one section	Possible candidate responses particles are moving and collide more particles in a gas are moving freely colliding with the walls of the container

Level 3	5–6	Additional guidance detailed explanation from both sections	Possible candidate responses particles in a gas are moving freely, colliding with the walls of the container as the volume decreases (rate of) collisions increases