

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	<p>increase in height results in decrease in pressure (1)</p> <p>non-linear relationship (1)</p> <p>use of numerical data (1) at least two different pressure and height values from the graph</p>	<p>pressure decreases with height</p> <p>accept inversely proportional in this context</p> <p>accept negative correlation</p> <p>double the height does not result in half the pressure</p> <p>pressure not does change evenly</p> <p>description of graph e.g. curved / not straight</p> <p>calculation of change in pressure e.g. 5000m to 10000 m pressure went down by 22</p>	(3) AO3

Question number	Answer	Additional guidance	Mark
(ii)	<p>any one from</p> <p>air becomes less dense (1)</p> <p>smaller weight (of air) above (1)</p> <p>lower temperature (1)</p>	<p>accept oxygen / atmosphere for air</p> <p>air gets thinner / (air) particles further apart / fewer particles / less particles</p> <p>less air above / smaller height of air above</p> <p>ignore change in value of g with height</p>	(1) AO1

Question Number	Answer	Additional guidance	Mark
(ii)	<p>An explanation linking</p> <p>graph of rubber band is non-linear / curved / not directly proportional (1)</p> <p>graph for unloading does not go through same points as loading (1)</p>	<p>(graph for) spring would be straight</p> <p>(graph for) spring would only have one line / go through the same points</p> <p>ignore reference to returning to original shape / length</p>	(2)

Q3.

Question number	Answer	Additional guidance	Mark
	<p>an explanation linking</p> <p>the area (of contact between person and bed) is smaller when standing up (1)</p> <p>same weight (over smaller area) so the pressure is greater when standing up (1)</p>	<p>accept reverse arguments</p> <p>weight is more concentrated / not distributed /not spread across bed (when standing up)</p> <p>uses $p = F/A$ argument (as a consequence of the smaller area, pressure is bigger)</p>	<p>(2) AO2</p>

Q4.

Question number	Answer	Additional guidance	Mark
	an explanation linking: density decreases as height increases (1) with (because) particles are further apart (higher up) (1)	ignore gravity accept reverse arguments density decreases as you go higher accept fewer particles per unit volume accept particles more spaced out	(2) AO3.2

Q5.

Question number	Answer	Additional guidance	Mark
	<p>An explanation that combines identification via a judgement (1 mark) to reach a conclusion via justification/reasoning (2 marks):</p> <ul style="list-style-type: none">• pressure in A is the highest and pressure in C is the lowest (pressure in B is between them) (1)• pressure depends on depth of liquid (so) can compare A and C because same liquid (hence) pressure in A is twice that of C (1)• pressure depends on density of liquid (so) can compare A and B since same depth hence pressure in A greater than pressure in B (1)	allow a mathematical approach, i.e. calculating all three pressures from the relevant data	(3)

Q6.

Question number	Indicative content	Mark
*	<p>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.</p> <p>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.</p> <p style="text-align: center;">AO1 (3 marks)</p> <ul style="list-style-type: none">• upthrust is the force on the submarine in the water (submerged) in a fluid• upthrust on the submarine and its weight act in opposite directions• upthrust is equal to the weight of water displaced by the submarine• the difference in pressures on the upper and lower surfaces of the submarine causes the upthrust <p style="text-align: center;">AO2 (3 marks)</p> <ul style="list-style-type: none">• the volume of the submarine is fixed so the upthrust on the submarine is constant• increasing/decreasing volume of water in tanks increases/decreases weight of submarine but does not affect upthrust• if weight increases to become greater than upthrust there is a resultant downward force on the submarine so the submarine sinks• if weight decreases to become less than upthrust there is a resultant upward force on the submarine so the submarine rises	(6)

Level	Mark	Descriptor
	0	No awardable content.
Level 1	1-2	<ul style="list-style-type: none"> • Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • 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)
Level 2	3-4	<ul style="list-style-type: none"> • Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • 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)
Level 3	5-6	<ul style="list-style-type: none"> • Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • 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)