Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic :15_Forces and their matter

Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 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 (example) content below is not prescriptive and candidates are not required to include the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. AO2 **Pressure** • difference in pressure between top and bottom of boat • top pressure is atmospheric • pressure on bottom of boat atmospheric plus that due to depth of water. **Unloaded boat** • density of boat less than density of water • floating objects are partially immersed • floating objects displace fluid / water • upthrust is due to the difference in pressure • upthrust is equal to the weight of the boat • upthrust is equal to the weight of fluid / water displaced **Boat with load** • the weight/density of the boat increases because of the load added • more upthrust is needed to balance the extra weight of the boat • more water has to be displaced to provide the upthrust • when the boat floats lower in the water it displaces more water • the weight of water displaced is the upthrust and is equal to the weight of the boat	**(6)**

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 made between elements in the context of the question. 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. 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. Lines of reasoning are supported by sustained application of relevant evidence. (AO2)

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 Elements of physics present i.e. isolated knowledge of principles **two** unconnected statements from any section	Possible candidate responses pressure difference upthrust water displaced displacement floating
Level 2	3–4	Additional guidance Some knowledge of principles with a logical connection made in one section and statement from one other section	Possible candidate responses upthrust and weight are balanced /upthrust is equal to the weight of the boat when load added upthrust increases difference in pressure between the top and bottom of the boat
Level 3	5–6	Additional guidance Detailed knowledge of principles with logical connections made in two sections.	Possible candidate responses upthrust is equal to the weight of water displaced. when load is added, weight increases more water is displaced

Q2.

Question number	Answer	Additional guidance	Mark
i	data points correctly identified (1) 50 ±2 80 ±2 evaluation (1) (-)30 ±4 kPa	award 1 mark if 80 and 50 seen ignore the lack of minus sign allow ecf from incorrect reading of either pressure at 2000m or pressure at 6000m for one mark	**(2)** **AO3**

Question number	Answer	Additional guidance	Mark
	any **one** suggestion of greater density of atmosphere (1) greater depth of atmosphere (above the aeroplane) (1) greater temperature (of the atmosphere) (1)	accept reverse argument more particles (per cubic metre) the air gets thicker greater weight of the atmosphere	**(1)** **AO1**

Q3.

	Answer	Acceptable answers	Mark
(i)	 (1) air resistance (1)	upward arrow on any part of line vertical line from any point on the diagram air friction, upthrust, drag Ignore any downward arrow labelled weight or gravity	**(2)**
(ii)	Balanced (1) Zero (1)		**(2)**

Q4.

Question Number:	Answer	Additional Guidance	Mark
	an explanation linking:	accept answers in terms of work = force x distance accept reverse arguments	**(3)** AO 3 2a AO 3 2b
	use of $P = \frac{F}{A}$ (1)		
	area of piston Y is less than area of piston Z (1)	accept K for piston Y and L for piston Z	
	(therefore) force K is less than force L (1)		

Q5.

Question number	Answer	Mark
	B  This shows the **only** direction normal to surface, acting towards surface	**1 AO3.1**

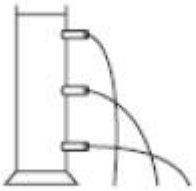
Q6.

Question number	Answer	Mark
	B	(1)

Q7.

Question number	Answer	Additional guidance	Mark
	D 6 N up A and C are incorrect because the force is upwards B is incorrect because the force is the sum of the two weights given.		**(1)** **AO3**

Q8.

Question number	Answer	Mark
	C  A,B and D are incorrect because pressure increases with depth	**(1)**