Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic : 8_Energy

Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	rearrange $p = \rho g h$ to give $\rho = p / (g h)$ (1) substitution using any point from graph (1) e.g. depth = 50km and pressure = 1.5 GPa $\rho = p / (g h)$ $= 1.5 \times 10^9 / (10 \times 50 \times 10^3)$ Evaluation (2) $= 3000$ (kg/m^3)	rearrangement and substitution in any order allow any combination from the graph and ignore 'pot' error here 'pot' error scores 2 marks maximum	(4)

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. **AO2 (3 marks) A03 (3 marks)** **A03 Interpretation and evaluation from the graph** Similarities: • both show increasing pressure with depth • both show a range of pressures over kilometre depths / heights Differences: • ocean water shows a linear relationship (straight line) but atmosphere gives a non-linear (curved) relationship • density of ocean water not changing with depth but density of atmosphere changes as you go higher • The pressures in the ocean recorded are much bigger (GPA compared with kPa) The depth of the ocean shown is up to 100km whereas the height of the atmosphere involved is only up to 10km **A02 Link between graph shapes and underlying physics** Similarities: • pressure is due to (increasing) weight of fluid (liquid / gas) above • more molecules above Differences: • atmosphere becomes thinner the higher you go molecules in the ocean stay (on average) the same distance apart but in the atmosphere they get further apart (on average) as you go higher up	(6)

Level	Mark	Descriptor
	0	• No awardable content
Level 1	1–2	• Interpretation and evaluation of the information attempted but will be limited with a focus on mainly just one variable. Demonstrates limited synthesis of understanding. (AO3) • 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	• Interpretation and evaluation of the information on both variables, synthesising mostly relevant understanding. (AO3) • 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	• Interpretation and evaluation of the information, demonstrating throughout the skills of synthesising relevant understanding. (AO3) • 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)

Q2.

Question number	Answer	Additional guidance	Mark
	An answer that combines points of interpretation/evaluation to provide a logical description: efficiency increases (at first) (1) to maximum efficiency (for mass of about 25 kg) (1)	 e.g. decreases for larger masses	**(2)**

Q3.

Question number	Answer	Additional guidance	Mark
	An answer that combines points of interpretation/evaluation to provide a logical description: efficiency increases (at first) (1) to maximum efficiency (for mass of about 25 kg) (1)	 e.g. decreases for larger masses	**(2)**

Q4.

Question number	Answer	Additional guidance	Mark
	An answer that combines the following points of application of knowledge and understanding to provide a logical description: • work is done against friction (1) • energy is stored in another specified way (1)	ignore references to friction as energy store acceptable stores are: • KE of water • thermal energy of water • thermal energy of air • (G)PE of water	**(2)**

Q5.

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. Use of equipment • Provide a measurable load; for example hang a cube on one end of the system / on spring (balance) • Provide a measurable effort; for example hang spring balance on other end of system • Method to measure distances moved; for example use metre rule Obtaining relevant data • Measure weight of cube with spring balance • Take reading of spring balance when being pulled • Measure height by which the cube is raised • Measure distance moved by (end of) spring balance. Processing results • calculate work done on cube = obtained weight x obtained distance • calculate work done by student = obtained force x obtained distance • calculate efficiency as (calculable) work done on cube / (calculable) work done by student • inspect results to look for relationship between weight of cube and efficiency • plot graph of efficiency against weight	**(6)** **AO3**

Level	Mark	Descriptor
	0	• No awardable content
Level 1	1–2	• Analyses the scientific information but understanding and connections are flawed. (AO3) • An incomplete plan that provides limited synthesis of understanding. (AO3)
Level 2	3–4	• Analyses the scientific information and provides some logical connections between scientific enquiry, techniques and procedures. (AO3) • A partially completed plan that synthesises mostly relevant understanding, but not entirely coherently. (AO3)
Level 3	5–6	• Analyses the scientific information and provide logical connections between scientific enquiry, techniques and procedures. (AO3) • A well-developed plan that synthesises relevant understanding coherently. (AO3)

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 At least two uses of equipment	Possible candidate responses Hang cubes on hook Spring balance on ring
Level 2	3–4	Additional guidance At least two methods of obtaining relevant data from use of equipment.	Possible candidate responses Measure weight of cube with spring balance. Hang cube on hook. Pull on other end. Measure how far cube has gone up. OR Put cube on hook. Put spring balance on ring. Pull and read force. Measure how far spring balance moves.
Level 3zz	5–6	Additional guidance At least two methods of obtaining relevant data from correct use of equipment and at least two descriptions of processing that data.	Possible candidate responses Use spring balance to measure weight of cube and force needed by student. Measure height that cube was raised by. Calculate work done by multiplying force and distance moved in each case.