Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 3_ Conservation of Energy

Name of the Student:_____
Max. Marks : 26 Marks **Time : 26 Minutes**

Mark Schemes

Q1.

	Answer	Acceptable answers	Mark
	Description including 3 of the following: • (Gravitational) potential energy (transferred) to KE(1) • Idea of energy transfer to heat/sound whilst descending (1) • Chemical energy is transferred to heat energy in Andrew (1) • Idea of energy dissipated on stopping (1)	(G)PE (transferred) to KE Allow gravitational energy for GPE Energy transferred to heat because of air resistance/ friction The energy goes to heat as he stops. Energy is transferred to the surroundings	**(3)**

Q2.

	Answer	Acceptable answers	Mark
(i)	12 (J) Ignore any unit given by candidate.	20 - 8 (J)	**(1)**
(ii)	An explanation linking any **two** of • (For the) same amount of electrical/supplied (energy/power) (1) • (CFL/it) has a greater output (of light energy) (1) • (CFL/it) wastes less (electrical energy) (1)	Same input (energy) gives out/produces more light/useful (energy) Do not accept more energy is used in the (CFL/it) Ignore brightness. (CFL/it) produces less thermal/heat (energy) Accept explanations using data from the energy transfer diagrams as	**(2)**

		comparisons eg (CFL/it) is four times as efficient gains both marks	

Q3.

Question Number	Answer	Additional guidance	Mark
(i)	kinetic (1)	**only** (adding another incorrect alternative negates)	**(1)** AO 2 1

Question Number	Answer	Additional guidance	Mark
(ii)	any one of increase the speed (of spinning) (1) increase the mass / weight (of the flywheel) (1)	 accept (idea of) faster ignore make it bigger	**(1)** AO 2 1

Q4.

	Answer	Acceptable answers	Mark
	kinetic (energy)	Movement (energy) KE	**(1)**

Q5.

	Answer	Acceptable answers	Mark
(i)	350 (J)	400 – 50 (J)	**(1)**
(ii)	Substitution 50 ÷ 400 (1) or $50 \times 100 / 400$ (%) Evaluation 13(%) (1)	12.5(%), 0.125, 0.13 or 1/8 Give full marks for correct answer, no working	**(2)**

Q6.

Question Number	Answer	Acceptable answers	Mark
(i)	electrical	electric	**(1)**

Question Number	Answer	Acceptable answers	Mark
(ii)	chemical		**(1)**

Q7.

Question Number	Answer	Acceptable answers	Mark
(i)	20 (J)	200 – 180 (even if calculated value from this is incorrect)	**(1)**

Question Number	Answer	Acceptable answers	Mark
(ii)	(changed to) {thermal energy / heat}	dissipated (lost) to {surroundings / motor / air / atmosphere} sound / noise **reject** if kinetic, light or chemical is mentioned	**(1)**

Question Number	Answer	Acceptable answers	Mark
(iii)	$\frac{180}{200} \times 100$ (1) 90 (%) (1)	award full marks for correct answer with no working $\frac{180}{200}$ 0.9, 9/10 Or [100 – (20/200)] % not needed but if a unit is given then maximum score is 1	**(2)**

Q8.

Question number	Answer	Additional guidance	Mark
	An explanation that combines identification - understanding (1 mark) and reasoning/justification - understanding (1 mark): foam contains pockets of air OR foam / air is an insulator (1) which reduces energy transfer to surroundings (1)		**(2)**

Q9.

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,AO3** **Non-renewable sources of energy** trend: less used/decrease in use (between 2012 and 2019) **fossil fuels** coal, gas, oil are running out / finite resource / sustainability argument produce carbon dioxide/ sulphur dioxide/ greenhouse gases (when burned) in power stations cause pollution/ smoke particles /damage to the environment causes climate change / global warming production of greenhouse gases needs to be reduced (for Britain to become carbon neutral) **nuclear fuels** no carbon dioxide produced radioactive waste produced safety concerns	**(6)** **AO2, AO3**

	Renewable sources of energy trend: more used /increase in use (between 2012 and 2019) renewable and non-renewable about equally used from 2019 solar, wind, hydroelectric, tidal, geothermal, wave and biomass never run out / are sustainable do not produce carbon dioxide/ greenhouse gases (except biomass) slow down climate change / global warming	

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)

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 about the resources, non-renewable or renewable **OR** the trend(s) in usage	Possible candidate responses coal is non-renewable and solar is renewable non-renewables are decreasing and renewables are increasing non-renewable resources are higher on (most of) the graph
Level 2	3–4	Additional guidance trend(s) **AND** limited explanation of the renewable trend **OR** limited explanation of the non-renewable trend	Possible candidate responses use of renewable resources is increasing because renewables are sustainable OR use of non-renewable resources are decreasing because they cause global warming
Level 3	5–6	Additional guidance both trends **AND** detailed explanation of one trend **AND** some explanation of the other trend	Possible candidate responses use of renewable resources are increasing **and** the use of non-renewable resources are decreasing because non-renewable resources are running out **and** wind turbines do not produce carbon dioxide