Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 3_Conservation Of Energy

Name of the Student:_____

Max. **Marks : 23 Marks**   **Time : 23 Minutes**
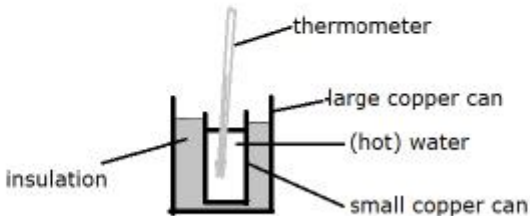
Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	substitution Time = 37/ 25 (1) Evaluation (1) = 1.5 (s)	Allow 1.48 (s) full marks will be awarded for correct numerical answer without working	(2)

Question number	Answer	Additional guidance	Mark
(ii)	substitution K.E. = $0.5 \times 1300 \times 20^2$ (1) evaluation (1) = 260,000 J	260 kJ full marks will be awarded for correct numerical answer without working	(2)

Q2.

Question Number	Answer	Mark
	B. when there are energy transfers, the total energy does not change *A is not correct because the total energy does not reduce* *C is not correct because the total energy does not increase* *D is not correct because there must be no net change in the total energy*	(1) AO1

Question Number	Answer	Additional guidance	Mark

(i)	A diagram showing:
	
	apparatus labelled to include **three** from
	  • thermometer
	  • water
	  • insulator / sand / sawdust/ material
	  • (copper) can
	
	                                  (1)
	
	thermometer in the **water** (1)
	
	arrangement for water and insulator in and between copper cans (e.g. as in diagram below) (1)
	
		independent of arrangement
		
		ignore kettle and stop clock
		
		accept reverse positions for water and insulator
			(3)
			AO2

Q3.

Question number	Answer	Additional guidance	Mark
	A description to include: mention relevant energy store such as GPE or chemical (1) 'correct' transfer in context (1)	allow KE or mechanical or thermal or heat chemical to (G)PE or chemical to KE (in lifting) allow misread GPE to KE/thermal on <u>slope</u> Allow KE to GPE in lifting	(2)

Q4.

	Answer	Additional guidance	Mark
	a description giving		(2) AO3
	as the density (of expanded polystyrene) increases the (thermal) conductivity decreases (1)	ORA	
	non-linear / gradient decreases / at a decreasing rate / levels off / plateaus / becomes (almost) constant (1)	allow inversely proportional / exponential for non-linear in this context ignore negative correlation unqualified quoted values are insufficient	

Q5.

Question Number	Answer	Additional guidance	Mark
(ii)	any **three** factors from:		(3) AO3
	{mass / volume} of water (1)	accept amount / specified values / "how much"	
	{volume / thickness / mass} of insulators /materials (1)	accept amount / specified values / "how much"	
	{starting / initial} temperature of water (1)	accept temperature of hot / boiling water / specified values	
	time interval / temperature change (1)	accept specified values of interval or change	
		unqualified "same time" is insufficient	

Q6.

	Answer	Acceptable answers	Mark
(ai)	A line connecting a train part with a useful energy transfer as shown below (1) Train part — useful energy transfer diesel engine — chemical to electrical — chemical to kinetic generator — electrical to kinetic — kinetic to chemical motor — kinetic to electrical	Lines need not be straight Ignore any arrow heads drawn Note: if more than one line is drawn from a train part then zero mark for that train part.	**(3)**
(aii)	(transfer of energy to) thermal (1)	heat/sound	**(1)**
(bi)	1400 – 1300 (= 100) (kJ) (1)		**(1)**
(bii)	Substitution (1) 1300 / 1400 × 100 Evaluation (1) 93(%) or 0.93	A value which rounds to 93(%) or 0.93 Correct answer with no working scores 2 marks	**(2)**
(c)	Any one from black is a good thermal radiator (1) (helps to) prevent motors overheating (1)	(good) emitter (helps to) remove wasted energy/ heat (from the motor)	**(1)**