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

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

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	select and substitute (1) (ΔGPE = m x g x Δh) = 1100 x 3.7 x 1.8 (x 10^3) evaluation (1) 7 326 000 (J) evaluation to 2 s.f. (1) 7 300 000 (J)	 any number rounding to 7 300 000 7326 scores 1 mark **independent mark** -any final answer stated to 2 s.f.	**(3)** **AO2.1**

Question number	Answer	Additional guidance	Mark
(ii)	select and substitute (1) (ΔKE = ½ m x v^2) = ½ 1100 x 88^2 evaluation (1) 4 300 000 (J)	ignore minus signs accept numbers that round to 4 300 000 (J) e.g. 4 259 200 (J) award full marks for the correct answer without working	**(2)** **AO2.1**

Question number	Answer	Additional guidance	Mark
iii	A description linking **three** from: 1. work is done against / by gravity (1) 2. **idea of** work done by the thrusters / jets (on the rover) (1) 3. (work done) by air/atmospheric resistance on the parachute (and rover) (1) 4. this reduces the kinetic energy (store) (1) 5. (there is a) decrease in the gravitational potential energy (store) of the rover (1) 6. (there is a) transfer of chemical energy from the thrusters (1) 7. energy transferred to thermal energy (store) (1) 8. (transfer) mechanically (to the thermal store) (1)	**KEY: attempt to explain <u>how work done</u> contributes towards the energy changes / conservation of energy** if no other mark scored allow one mark for work = force x distance	**(3) AO2.1**

Q2.

Question number	Answer	Additional guidance	Mark
(i)	recall and substitution into (1) gpe = m x g x h (gpe) = 4.5 x 10 x 20 evaluation (1) 900(J)	 allow 90(J) for 1 mark award full marks for the correct answer without working	**(2)**

Question number	Answer	Additional guidance	Mark
ii	900(J)	allow ecf from bi	(1)

Question number	Answer	Additional guidance	Mark
iii	recall and substitution (1) power = work done / time taken (power =) 900 / 4 evaluation (1) 200 (W)	allow ecf from bi or bii accept 230(W), 225(W) award full marks for the correct answer without working	(2)

Q3.

Question number	Answer	Additional guidance	Mark
	substitution (1) 7440 = 645 x distance rearrangement (1) (distance =) $\frac{7440}{645}$ evaluation and rounding to 3sf (1) 11.5 (m)	rearrangement and substitution in either order allow substitution of correct values into a visible, incorrectly rearranged algebraic equation for this mark only (distance =) $\frac{\text{work done}}{\text{force}}$ 11.53 (m) scores 2 marks only award full marks for the correct answer without working	(3) AO2.1

Q4.

Question number	Answer	Additional guidance	Mark
(i)	selection and substitution (1) (KE =) ½ x 1200 x 16(.0)^2 evaluation in kJ (1) (KE =) 150 (kJ)	(KE =) ½ x 1200 x 16(.0)^2 x 10^{-3} accept any value that rounds to 150 e.g. 153.6 award full marks for correct answer without working. award 1 mark for 153.6 or 150 to any other power of ten	**(2)** **AO2**

Question number	Answer	Additional guidance	Mark
(ii)	selection and substitution (1) $17.5 (\times 10^3) = \frac{126 (\times 10^6)}{t}$ re-arrangement and evaluation (1) (t=) 2(.0) (h)	alternative method selection and rearrangement (1) (t =) $\frac{\text{E(nergy)}}{\text{P(ower)}}$ or (t=) $\frac{126 (\times 10^6)}{17.5 (\times 10^3)}$ (substitution and) evaluation (1) (t=) 2(.0) (h) award full marks for correct answer without working. allow 1 mark for 7(.2) to any power of ten (incorrect time conversion) allow 1 mark for 2(.0) to any power of 10 (POT error)	**(2)** **AO2**

Question number	Answer	Additional guidance	Mark
(iii)	an explanation linking (energy transfers when the car is decelerating) (from) kinetic energy (store) (1) (to) chemical energy (store) (1)	 idea of energy that would be otherwise wasted uses an electrical pathway {electric current / electricity / emf} produced allow mechanical for kinetic in this context recharges battery increases available energy store of battery more useful energy available	**(2)** **AO2**