

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
(i)	recall and substitution into (1) $gpe = m \times g \times h$ $(gpe) = 4.5 \times 10 \times 20$ 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 230(W) 225(W) award full marks for the correct answer without working	(2)

Q2.

Question number	Answer	Additional guidance	Mark
	substitutions (2) $(\Delta GPE = m \times g \times \Delta h)$ $= 0.052 \times 10 \times (0.0)5 \text{ (1)}$ converts 5 cm to 0.05 m (1) evaluation (1) $= 0.026 \text{ (J)}$	0.05 seen award full marks for the correct answer without working 0.026 to any other power of ten scores 2 marks	(3) AO2

Q3.

Question number	Answer	Additional guidance	Mark
i	substitution (1) $(I = \frac{P}{V}) = \frac{1.9 \text{ (x } 10^3)}{230} \text{ (1)}$ evaluation (1) 8.3 (A)	8.3 / 8.26 (A) award full marks for correct answer without working award one mark for $8.26 \times 10^{-3} / 0.0083$	(2) AO2

Question number	Answer	Additional guidance	Mark
ii	choice and substitution (1) $E = I \times V \times t$ $= 7.4 \times 230 \times 120$ evaluation (1) 200000 (J)	accept 204000 / 204240 award full marks for correct answer without working award 1 mark for 3400 / 3404 (J) (using 2 minutes as time)	(2) AO2

Q4.

Question number	Answer	Additional guidance	Mark
	substitution (1) $KE = \frac{1}{2} \times 58 (\times 10^{-3}) \times 28^2$ conversion (1) uses 58×10^{-3} or 0.058 evaluation (1) 23 (J)	do not penalise p.o.t.e. at this stage award full marks for any answer that rounds to 23 (e.g. 22.736) (J) award max two marks for any answer that rounds to 2.3 to any other power of 10 consolation mark for not squaring 28 (8.1(2) to any p.o.t.) (maximum 1 mark)	(3) AO2

Q5.

Question number	Answer	Additional guidance	Mark
	<p>substitution (1)</p> <p>(mean speed)</p> $= \frac{1.31 + 1.27 + 1.16}{3}$ <p>evaluation (1)</p> <p>speed = 1.25 (m/s)</p>	$\frac{3.74}{3}$ <p>any number that rounds to 1.25 (m/s) e.g. 1.247 accept 1.2 or 1.3</p> <p>allow 1.24</p> <p>award full marks for the correct answer without working</p>	<p>(2) AO2</p>

Q6.

Question	Answer	Additional guidance	Mark
(i)	substitution (1) $(P =) \frac{130\,000}{87}$ evaluation (1) $(P =) 1494$ (W) value to 2sf (1) 1500 (W)	award two marks for the correct answer without working independent mark for any number to 2sf	(3) AO2.1

Question	Answer	Additional guidance	Mark
(ii)	substitution (1) $(\text{efficiency} =) \frac{96\,000}{130\,000}$ evaluation (1) $(\text{efficiency} =) 0.74$	accept values that round to 0.74 e.g. 0.7385 accept 74 % for 2 marks allow 74 without % sign for 1 mark only allow 0.73 or 73% for 1 mark award full marks for the correct answer without working	(2) AO2.1