

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Mark Schemes

Q1.

Question Number	Answer	Additional guidance	Mark
	an explanation linking use of lubrication / oil (1) to reduce friction (between parts) (1)		(2) AO 2 1

Q2.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) ($\Delta GPE =$) $64 \times 10 \times 24$ evaluation (1) 15 000 (J)	accept 15 360(J) or 15 400(J) award full marks for correct answer without working.	(2) AO2

Question number	Answer	Additional guidance	Mark
(ii)	substitution (1) $(KE =) \frac{1}{2} \times 64 \times 6^{(2)}$ calculation of 6^2 (1) evaluation (1) 1200 (J)	 accept 1152(J) award full marks for correct answer without working. 192 (J) scores 2 marks	(3) AO2

Question number	Answer	Additional guidance	Mark
(iii)	an explanation linking any two from: the kinetic energy (store)/it decreases (to zero) (1) (the energy) has dissipated (1) to the surroundings (1) thermal energy (store) increases (1)	 transferred to ground/brake(s) pads make the brakes hot	(2) AO2

Q3.

Question Number	Answer	Additional guidance	Mark
(i)	1840 (J) (1)		(1)

Question Number	Answer		Mark
(ii)	substitution (1) (efficiency =) $\frac{160}{2000}$ evaluation (1) 0.08 OR 8 (%)	Ignore any units award full marks for the correct answer without working	(2)

Question Number	Answer	Additional guidance	Mark
(iii)	reference to : thermal (energy) (1) OR (lost to) environment /surroundings/dissipated (1) OR transferred/changed to another form of energy (1)	IGNORE gets re-used / recycled heat OR (to) atmosphere / (to) the air /sky/ steam accept named form of energy	(1)

Question Number	Answer	Additional guidance	Mark
(iv)	an answer that makes reference to any two from produces/ releases/makes/gives off carbon dioxide / CO₂ /greenhouse gases (1) produces carbon monoxide / CO (1) produces air pollution (1) produces sulphur dioxide/ SO₂ (1) produces soot /smoke (1) mining coal (1)	IGNORE unqualified pollutes/pollution IGNORE ozone layer IGNORE non-renewable IGNORE 'fumes' (causes) greenhouse effect OR contributes to global warming/climate change allow CO₂ causes carbon monoxide poisoning accept (harmful) particles /dust causes <u>acid rain</u> blackens/ stains buildings/statues slag heaps/ mining damages the landscape/habitats/ecosystem OR ground needs to be dug up	(2)

Q4.

Question number	Answer	Additional guidance	Mark
(i)	Substitution (1) PE = $7.26 \times 10 \times 1.3$ Answer (1) 94.4 (J)		(2)

Question number	Answer	Additional guidance	Mark
(ii)	An explanation that combines identification - application of knowledge (1 mark) and reasoning/justification - application of understanding (1 mark): (energy stored changes between) gravitational potential energy, kinetic energy (1) - Potential energy increases as it rises / decreases as it falls. (1)	Ignore reference to energy change after hitting the ground (eg sound / heat)	(2)