

Name of the Student:_____

Max. Marks : 21 Marks

Time : 21 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)	Any one of: solar panel (1) bio-gas (1) geothermal (1)	reject wind unless reference made to electrical heater supplied by wind-powered dynamo.	(1)
Question number	Answer	Additional guidance	Mark
(ii)	substitution and rearrangement (1) efficiency. = useful energy / total energy 0.96×7500 evaluation (1) 7200 (J)	full marks will be awarded for correct numerical answer without working	(2)

Q3.

Question number	Answer	Additional guidance	Mark
(i)	5000(J)	24 000 – 19 000	(1) AO2
Question number	Answer	Additional guidance	Mark
(ii)	substitution (1) $(\text{efficiency} =) \frac{19000}{24000} (\times 100\%)$ evaluation(1) 0.79 or 79%	allow 0.8 do not award 79 without percentage award full marks for correct answer without working.	(2) AO2

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

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