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Year 10–11 • Cambridge IGCSE Physics 0625

Energy, Work & Power



Mark Scheme – Teacher Copy

Answers, marking points and guidance for the Energy, Work and Power topic practice paper (Cambridge IGCSE Physics 0625 style).

Energy stores | Work done | KE & GPE | Power | Efficiency | Resources

KEY IDEAS IN THIS PAPER **TAKE g = 9.8 N/kg** **CORE + EXTENDED**

Name: _____ Class: _____

Date set: _____ Date due: _____

What's inside

Question 1	Energy stores on a roller-coaster	**8 marks**
Question 2	Work done	**6 marks**
Question 3	GPE and kinetic energy [Extended]	**8 marks**
Question 4	Power	**9 marks**
Question 5	Efficiency [Extended]	**5 marks**
Question 6	Energy resources	**9 marks**

Marking notes

- ; separates marking points. / separates alternatives.
- ( ) words in brackets are not needed for the mark.
- ecf = error carried forward from an earlier part.
- Final answers need the correct unit unless printed.

Total marks

45

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Energy, Work and Power – Mark Scheme

Maximum mark: 45 (Core: 30). ";" separates marking points. Accept correct alternative wording. Apply error carried forward (ecf) where shown. Do not award a final-answer mark if the unit is wrong or missing, unless the unit is printed on the answer line.

Question 1 – Energy stores on a roller-coaster

Q	Answer	Mark	Guidance
1(a)	gravitational potential (energy store);	1	allow: GPE
1(b)	kinetic (energy store);	1	
1(c)	thermal / internal (store) of the brakes / surroundings; (mechanically) by work done by friction / by heating;	2	do not allow: "heat store"
1(d)	energy cannot be created or destroyed; it is only transferred from one store to another / total energy stays the same;	2	
1(e)	(some) energy is transferred to the thermal store of the surroundings / dissipated by friction / air resistance; so the car cannot regain all the gravitational potential energy it had at A / not enough energy to reach that height;	2	allow: the total energy is the GPE at A, so the car can never have more GPE than this
	Total	**8**	

Question 2 – Work done

Q	Answer	Mark	Guidance
2(a)	work done = force × distance (moved in the direction of the force);	1	allow: W = F × d
2(b)	40 × 6.0; 240 (J);	2	correct answer with no working: 2 marks
2(c)	240 J;	1	ecf from (b); allow: same as the work done
2(d)	150 × 1.2; 180 (J);	2	
	Total	**6**	

Question 3 – Gravitational potential and kinetic energy [Extended]

Q	Answer	Mark	Guidance
3(a)	mgh or 0.20 × 9.8 × 1.8; 3.5 (J);	2	allow 3.53 J; allow 3.6 J if g = 10 N/kg used
3(b)	½mv^2 = 3.5 (J) / kinetic energy = loss in GPE; v^2 = 2 × 3.5 / 0.20 = 35; 5.9 (m/s);	3	ecf from (a); allow 6.0 m/s
3(c)	½ × 1200 × 15^2; 135 000 (J);	2	allow 1.35 × 10^5 J or 1.4 × 10^5 J
3(d)	4 (times);	1	do not allow: 2 times
	Total	**8**	

Question 4 – Power

Q	Answer	Mark	Guidance
4(a)	work done per unit time / energy transferred per unit time;	1	allow: rate of doing work / rate of energy transfer
4(b)	600 × 3.0; 1800 (J);	2	
4(c)	1800 / 4.0; 450 (W);	2	ecf from (b)
4(d)	same work done (1800 J); second student has smaller power (180 W);	2	do not allow: “less work”
4(e)	2000 × 180 or 2000 W and 180 s seen; 360 000 (J);	2	allow 3.6 × 10^5 J; 2000 × 3 = 6000 scores 1 mark only
	Total	**9**	

Question 5 – Efficiency [Extended]

Q	Answer	Mark	Guidance
5(a)	(350 / 500) × 100; 70 (%);	2	allow 0.70 for 1 mark only
5(b)	lubricate (moving parts) / reduce friction;	1	allow: reduce resistance of the coils / reduce noise
5(c)	350 / 5.0; 70 (W);	2	500 / 5.0 = 100 W scores 1 mark only
	Total	**5**	

Question 6 – Energy resources

Q	Answer	Mark	Guidance
6(a)	coal: non-renewable; wind: renewable; natural gas: non-renewable; hydroelectric: renewable; nuclear fission: non-renewable;	2	all five correct: 2 marks; three or four correct: 1 mark
6(b)	advantage: renewable / no fuel cost / no carbon dioxide or polluting gases produced when working; disadvantage: unreliable as the wind does not always blow / noisy / takes up a lot of land / spoils the view / harms birds;	2	do not allow: “cheap” alone
6(c)	coal is burned to heat water and produce steam; (high-pressure) steam turns the turbine; turbine turns (drives) the generator, which produces electricity;	3	
6(d)	the Sun; nuclear fusion (in the Sun);	2	do not allow: nuclear fission
	Total	**9**	

Paper total: 45 | Core total: 30 | Extended-only marks: Q3, Q5, 6(d)