

## P1 - Energy Mark Scheme

### Section 1: Know

In this section is worth one mark.

1. Energy is the stored capacity to do work
2. Mechanical working, Radiation, Heating, Electrical working
3. Thermal, Kinetic, Gravitational, Chemical, Elastic, Electrical, Magnetic and Nuclear
4. Energy cannot be created or destroyed, only transferred.
5. Power = Energy / time
6.  $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$
7. Readily available, reliable.
8. Non-renewable, releases carbon dioxide.
9. The energy store filled when an object is raised
10. By a force moving an object through a distance

### Section 2: Apply

11. B
12. B
13. A
14. C
15. C
16. Advantage: the energy will always be replaced/ it will not run out; it is renewable; it does not use fuel or mains electricity; it is free to run/ it is cheap to run; a battery might leak/ no pollution with a solar cell/does not release carbon dioxide.  
Disadvantage: if the Sun goes in the pump will stop; it will not work at night or in the dark/ it must be in the Sun to work/ it is not sunny all the time/not reliable (*do not accept 'can be used again'*) 2 marks total. 1 mark for one advantage/disadvantage
17.  $P = E/t$             1  
450/82            1  
5.5W            1 *need answer and unit for final mark. Final answer with no working scores 1.*  
Allow more than one decimal place, but deduct for no decimal places
18. Graph C  
Power output changes throughout the day            1  
Depending on the amount of wind            1  
*Allow answers which exclude graphs A and B for first mark and a link to amount of wind for second mark. Allow "C as wind turbines are unreliable" for 1 mark*
19.  $P=E/t$   
81kJ = 81000J, 6 hours = 21600s            1  
81000/21600 = 3.75W            1  
*Needs units. Correct answer no working scores 2. Allow 1 for incorrect unit conversion but correct division. Do not allow a mark if they have only done one unit conversion (even if right)*
20. 24 hours = 86400s  
3.75 x 86400 = 324000J            1  
*needs units, allow ECF from incorrect answer to 29*

### Section 3: Exam style practice

Q21.

- (a) any **one** from
- she is not moving **or** falling  
*accept 'she has not dived or jumped'*  
*award a mark for an answer which implies she is not moving*
  - she is standing still  
*accept 'she is still'*

1. 1 (L5)

- (b) (i) • 8

2. 1 (L5)

- (ii) any **one** from
- the total energy is the same  
*accept 'they are the same'*
  - the gravitational potential and the kinetic energy add up to 8  
*accept 'they all add up to 8'*

3. 1 (L6)

- (c) (i) • gravity  
*accept 'gravitational' or 'gravitational pull'*  
*accept 'weight'*  
*do not accept 'mass'*

4. 1 (L5)

- (ii) any **one** from
- the distance between stages **or** drawings increases  
*accept 'they are further apart'*
  - she falls further each time  
*accept 'the positions are further apart'*  
*accept 'the arrows get longer'*  
*accept 'her kinetic energy increases'*  
*'by the position of her body' is insufficient*

5. 1 (L6)

- (d) any **one** from
- friction  
*accept 'water resistance'*  
*do not accept 'air resistance'*
  - drag  
*accept 'upthrust'*  
*'resistance' is insufficient*

1 (L6)

6. [6]

**Q22** (a) (i) While the book was falling, its potential energy was being transformed into kinetic energy.

*ie a  $\surd$  in the second box down*  
*if more than one box is ticked award no mark*

1

- (ii) 7.5 **or** just under 7.5

1

(b) any **one** from

- transferred to the surroundings **or** spread out into the surroundings  
*accept 'goes into the floor or atmosphere'*

- turned to thermal energy  
*accept 'sound' do not accept 'light' do not accept 'it has changed'*

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