Practice Question Set For GCSE
**Subject : Physics**
**Paper-1 Topic: Energy (High Demand)**

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**Name of the Student**:_____
**Max. Marks : 22 Marks** **Time : 22 Minutes**

Mark Schemes

## Q1.

(a) **Child**
gravitational potential energy decreases
**1**

kinetic energy increases **and** then decreases to zero
**1**

**Springs**
elastic potential energy increases
*ignore references to kinetic energy of the springs*
**1**

**Surroundings**
internal / thermal store of energy increases
*allow energy is dissipated*
*allow (average) kinetic energy of the particles increases*
**1**

*ignore descriptions of energy transfers before the child reaches position A*

(b) **At position A**
$4.9 = 0.5 \times k \times 0.056^2$
**1**

$k = \frac{2 \times 4.9}{0.056^2} = 3125$ (N/m)
**1**

**At position B**
$8.1 = 0.5 \times 3125 \times e^2$
*allow a correct substitution of an incorrectly calculated value of k using 0.056 m **and** 4.9 J*
**1**

$e = \sqrt{\left(\frac{2 \times 8.1}{3125}\right)}$
*allow $e^2 = 0.005184$*
*allow a correct re-arrangement using an incorrectly calculated value of k*
**1**

$e = 0.072$ (m)
*allow an answer consistent with their calculated value of k*

1

(c) the total energy transferred by the child

1

**[10]**

## Q2.

(a) solar

*allow biofuel / biodiesel allow wave power*

1

(b) sometimes there is no wind (but the battery can still be charged using the generator)

*allow if the generator breaks then the turbine can still generate electricity*

1

when there is wind less fuel is burned

*allow a disadvantage of burning fossil fuel*

1

(c) carbon dioxide

1

increases global warming

**OR**

sulfur dioxide or NOx emissions (1)

increases acid rain (1)

**OR**

particulates or NOx emissions (1)

can harm living organisms (1)

*allow increases the greenhouse effect*

1

(d) 81 kJ = 81 000 J

1

$81000 = 0.5 \times 8000 \times v^2$

*allow a correct substitution using an incorrectly/not converted value of energy*

1

$$v = \sqrt{\frac{81\,000}{0.5 \times 8000}}$$

*allow a correct re-arrangement using an incorrectly/not converted value of energy*

1

v = 4.5 (m/s)

*allow a correct calculation using an incorrectly/not converted value of energy*

1

(e) $19600 = 8000 \times 9.8 \times \Delta h$

1

$$\Delta h = \frac{19\,600}{8000 \times 9.8}$$

1

$\Delta h = 0.25$ m

1

**[12]**