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

Q1.

A house has a boiler to provide hot water.

One type of boiler burns natural gas.

Natural gas is a non-renewable source of energy.

(i) State a renewable source of energy that could be used to heat water in a house.

(1)

.....

Figure 8 shows some information in a booklet supplied with a gas boiler.

fuel	natural gas
temperature of hot water	65°C
energy supplied to the boiler in one second	7500 J
efficiency of boiler	96%

Figure 8

(ii) Calculate the energy transferred to the water by the boiler in one second.

(2)

energy transferred to water = ... J

(Total for question = 3 marks)

Q2.

Figure 9 shows a person on a skateboard at the top of a ramp.

At P, the person is not moving.

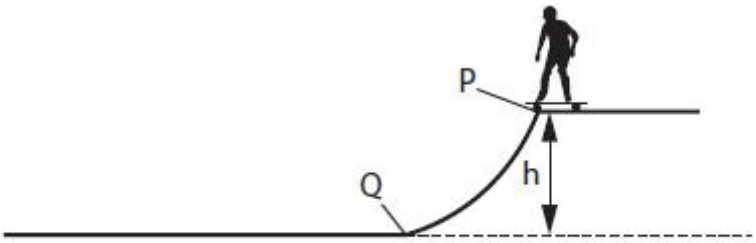


Figure 9

Figure 10 is a diagram that represents energy changes from P to Q.

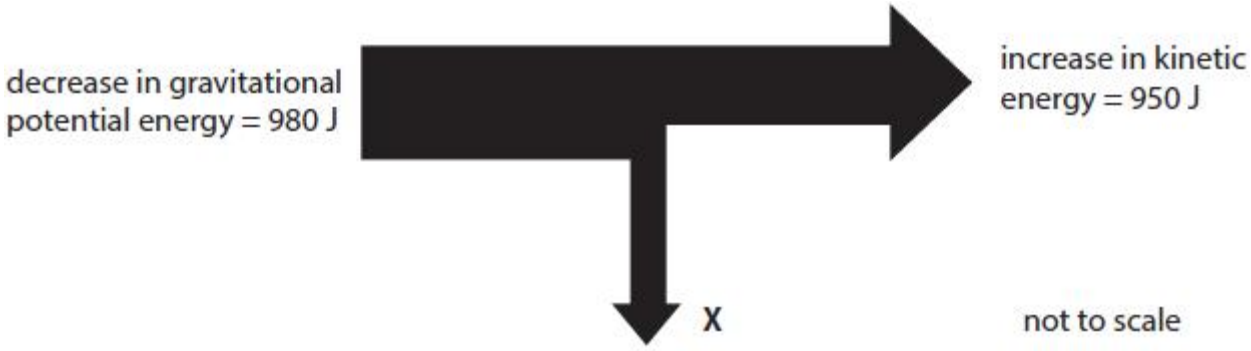


Figure 10

(i) State what is represented by **X**.

(1)

.....

.....

(ii) Calculate the value of **X**.

(1)

value of **X** = ... J

(iii) Calculate the efficiency of the system represented in Figure 10.

(2)

efficiency = ...

(Total for question = 4 marks)

Q3.

Figure 1 shows a solar-powered charger for a mobile phone.

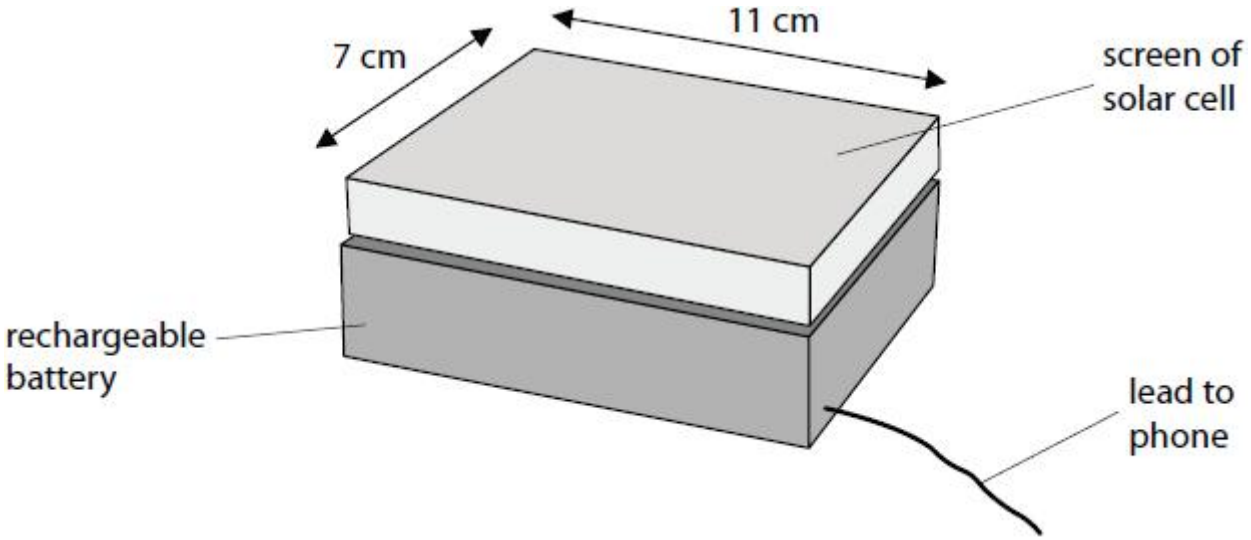


Figure 1

The screen of the solar cell takes in energy from the Sun.

State how energy is stored in the charger.

(1)

.....

.....

(Total for question = 1 mark)

Q4.

A student lifts a toy car from a bench and places the toy car at the top of a slope as shown in Figure 9.

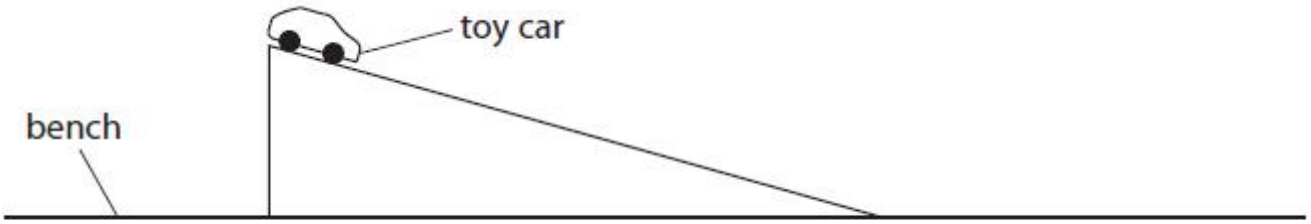


Figure 9

When the toy car rolls down the slope, some energy is transferred to the surroundings as thermal energy.

State how the student could calculate the amount of energy transferred to the surroundings.

(1)

.....

.....

(Total for question = 1 mark)

Q5.

A student lifts a toy car from a bench and places the toy car at the top of a slope as shown in Figure 9.

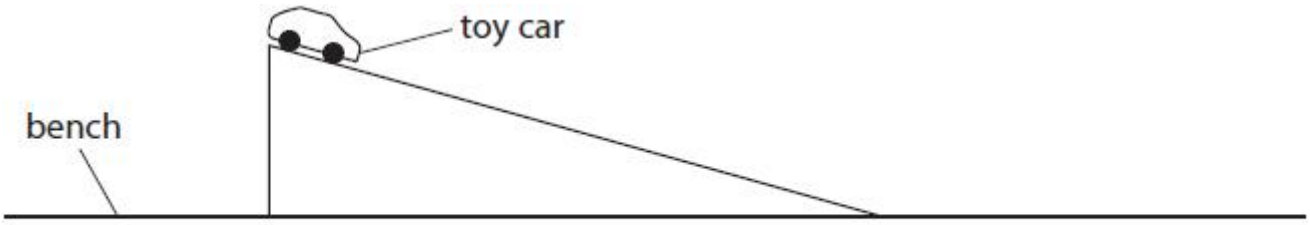


Figure 9

The student needs to develop the experiment to determine the loss in potential energy and the gain in kinetic energy as the toy car is rolling down the slope.

State the other measurements the student must make.

(2)

.....

.....

.....

.....

(Total for question = 2 marks)

Q6.

Figure 9 shows a person on a skateboard at the top of a ramp.

At P, the person is not moving.

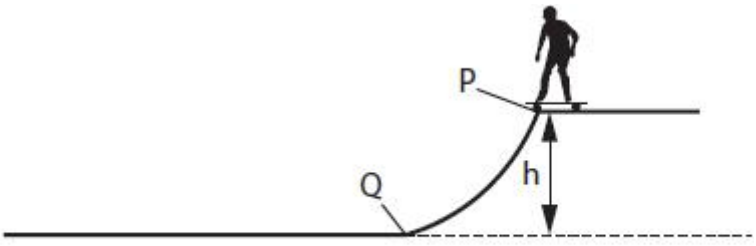


Figure 9

The person would like to start from P again but have a greater velocity at Q.

Suggest **two** ways that this can be achieved.

(2)

1 .....

.....

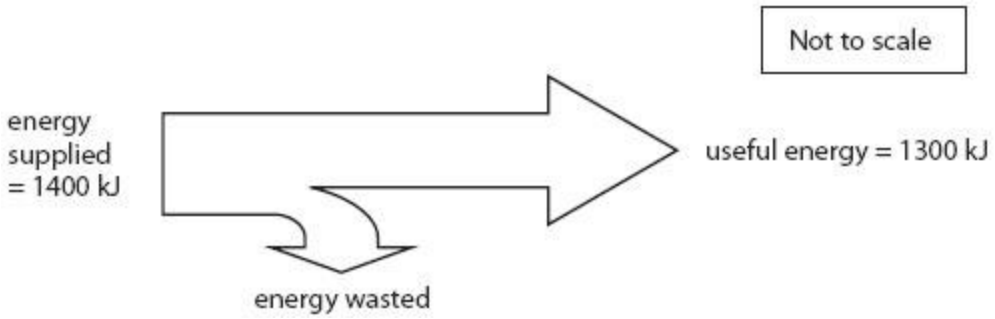
2 .....

.....

(Total for question = 2 marks)

Q7.

The diagram represents the energy transfer in one second in the generator.



(i) Calculate the amount of energy wasted in one second in the generator.

(1)

.....

(ii) Calculate the efficiency of the generator.

(2)

.....

Q8.

* Figure 12 is a speed-time graph for a car moving on a horizontal road.

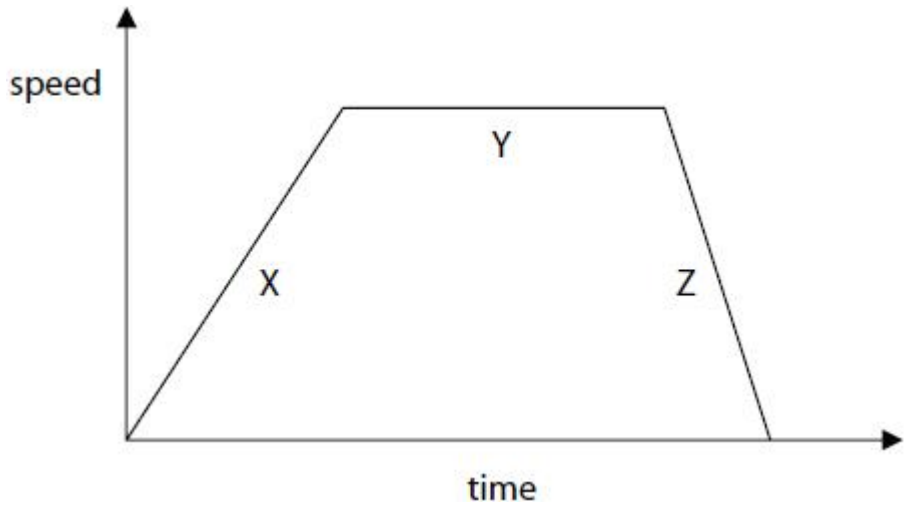


Figure 12

Describe the energy transfers taking place during the movement of the car.

You should refer to energy stores as well as transfers between energy stores for all three sections of the graph.

(6)

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(Total for question = 6 marks)