Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Q1.

Electricity can be generated using a water turbine.

(i) Water gains kinetic energy by falling from the top of a dam.

Calculate the minimum height that 7.0 kg of water must fall to gain 1300 J of kinetic energy.

(3)

minimum height = ... m

(ii) As water enters the turbine at the bottom of the dam, the kinetic energy of 8.0 kg of moving water is 1100 J.

Calculate the speed of the moving water as it enters the turbine.

(3)

speed = ... m/s

(Total for question = 6 marks)

Q2.

Moving air can be used to generate electricity using a wind turbine.

Figure 8 is a graph of kinetic energy against wind speed for a mass of moving air.

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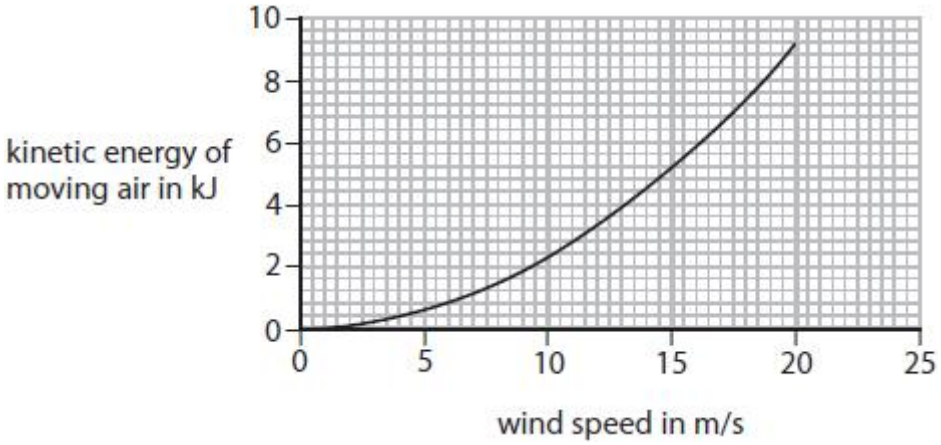


Figure 8

Just before the air reaches a wind turbine it has a wind speed of 15 m/s.

When the air has gone through the turbine it has a wind speed of 13 m/s.

As the air moves through the turbine some of its kinetic energy is transferred to the turbine.

Use the graph to determine the percentage of the kinetic energy transferred to the turbine from the air.

(3)

percentage of kinetic energy transferred from the air = ... %

(Total for question = 3 marks)

Q3.

Which of these is a non-renewable source of energy?

(1)

- ☒ **A** geothermal
- ☒ **B** natural gas
- ☒ **C** tidal
- ☒ **D** solar

(Total for question = 1 mark)

Q4.

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Explain why renewable sources provide an increasing fraction of the electricity supply for many countries.

(2)

.....

.....

.....

.....

(Total for question = 2 marks)

Q5.

Figure 1 shows a person on a skateboard at the top of a ramp.

At P, the person is not moving.

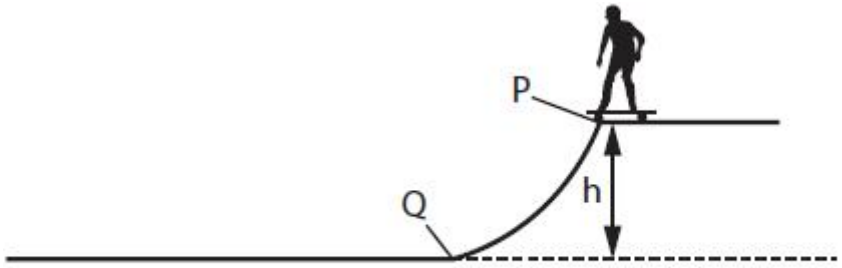


Figure 1

Figure 2 is a diagram that represents energy changes from P to Q.

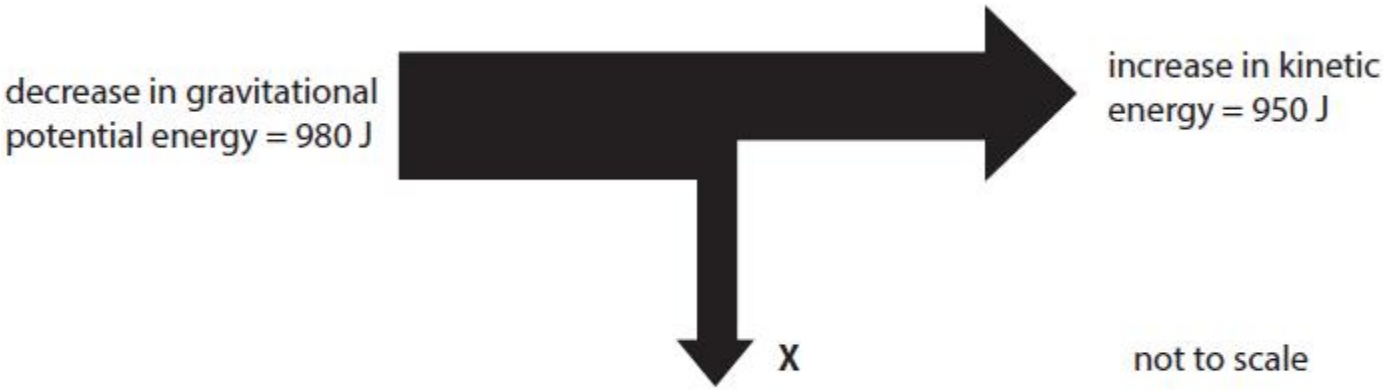


Figure 2

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

(1)

.....

.....

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

(1)

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

(iii) Calculate the efficiency of the system represented in Figure 2.

(2)

efficiency = ...

(Total for question = 4 marks)

Q6.

A student lifts a toy car from a bench and places the toy car at the top of a slope as shown in Figure 1.

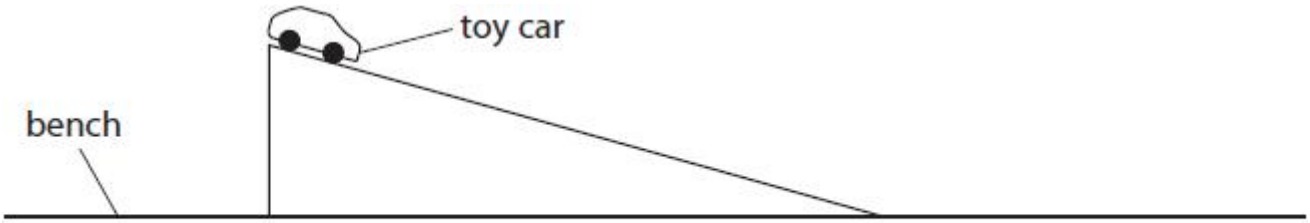


Figure 1

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)

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