Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

* A student has the equipment shown in Figure 12.

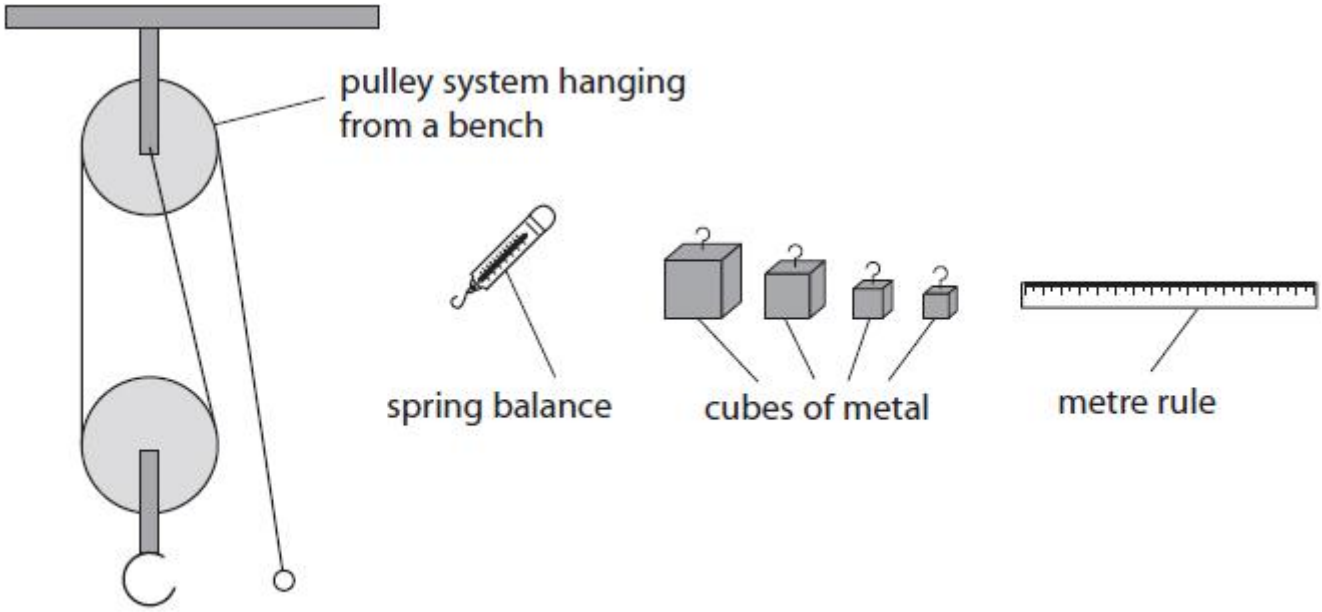


Figure 12

Devise an experiment to investigate how the efficiency of the pulley system varies with the weight of metal being lifted.

Your answer should include how you will use your measurements.

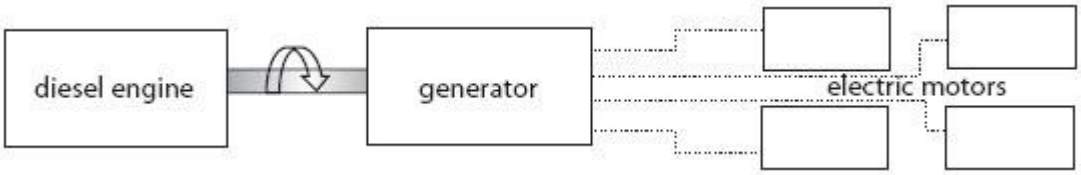
(6)

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

(Total for question = 6 marks)

Q2.

(a) A train is powered by a diesel engine.
The diesel engine is used to turn a generator.
The generator provides electricity for electric motors which drive the wheels.



(i) Draw one straight line from each train part to its useful energy transfer.

(3)

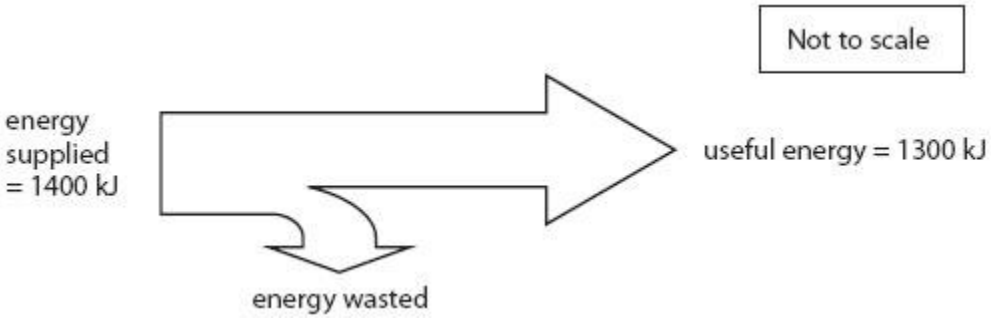
train part	useful energy transfer
diesel engine	chemical to electrical
	chemical to kinetic
generator	electrical to kinetic
	kinetic to chemical
motor	kinetic to electrical

(ii) State **one** example of a non-useful energy transfer in the motor.

(1)

.....

(b) 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)

.....

(c) The electric motors which drive the wheels are painted black.
Suggest why the motors are painted black.

(1)

.....

.....

(Total for Question is 8 marks)

Q3.

A cyclist is riding a bicycle at a steady velocity of 12 m/s.

The cyclist and bicycle have a total mass of 68 kg.

Describe the energy transfers that happen when the cyclist uses the brakes to stop.

(2)

.....

.....

.....

.....

(Total for question = 2 marks)

Q4.

A cyclist is riding a bicycle at a steady velocity of 12 m/s.

The cyclist and bicycle have a total mass of 68 kg.

$$KE = \frac{1}{2} \times m \times v^2$$

Describe the energy transfers that happen when the cyclist uses the brakes to stop.

(2)

.....

.....

.....

.....

(Total for question = 2 marks)