Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 3_ Conservation of Energy

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

Q1.

(i) Which of these would be a typical speed for a racing cyclist travelling down a steep straight slope?

(1)

- ☒ **A** 0.2 m/s
- ☒ **B** 2 m/s
- ☒ **C** 20 m/s
- ☒ **D** 200 m/s

(ii) A cyclist travels down a slope.

The top of the slope is 20 m vertically above the bottom of the slope.
The cyclist has a mass of 75 kg.
Calculate the change in gravitational potential energy of the cyclist between the top and the bottom of the slope.
The gravitational field strength, g, is 10 N/kg.

(3)

change in gravitational potential energy = ... J

(Total for question = 4 marks)

Q2.

Some students investigate the efficiency of electric motors.
(a) (i) The students find that one electric motor has an efficiency of 60%.
Explain in terms of energy what is meant by an efficiency of 60%.

(2)

.....

.....

.....

.....

(ii) The students use some motors to lift weights.
The students measure the input power and output power of two motors.
Complete the sentence by putting a cross (☒) in the box next to your answer.
The power of a motor is the rate at which it transfers

(1)

☒ **A** current

☒ **B** energy

☒ **C** voltage

☒ **D** charge

(iii) The first motor has a power rating of 20 W.
The motor is used for 15 s.
Calculate the energy supplied to the motor.

(2)

energy supplied to the motor =..... .J

(iv) In the second motor, the useful output power was 18 W when the input power was 24 W.
Calculate the efficiency of this motor.

(2)

efficiency =..... .%

(b) One of the students states that all of the energy supplied to a motor is transferred into other forms.
Complete the following sentence by putting a cross (■) in the box next to your answer.
This statement is one example of the idea of

(1)

☒ **A** renewable energy

☒ **B** conservation of energy

☒ **C** non-renewable energy

☒ **D** sustainable energy

(Total for Question = 8 marks)

Q3.

Figure 7 shows a skier going down a hill.

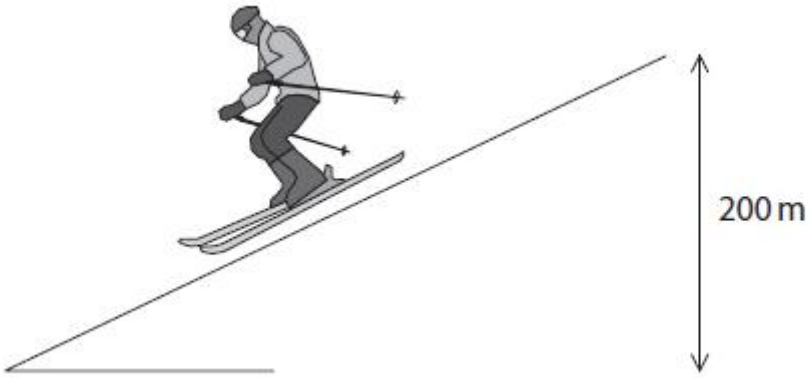

Figure 7

She descends through a vertical height of 200 m.

The skier's mass is 65 kg.

(i) Calculate the change in gravitational potential energy.

Use the equation

$$\Delta GPE = m \times g \times \Delta h$$

Take the gravitational field strength, g, as 10 N / kg.

(2)

change in gravitational potential energy = ... J

(ii) At the bottom of the slope her speed was 36 m/s.

Calculate her kinetic energy at the bottom of the slope.
Use the equation

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

(3)

kinetic energy = ... J