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

Q1.

Figure 15 shows a foam jacket around a copper cylinder.

Figure 15

The hot water is stored in the copper cylinder until it is needed.

The foam jacket helps to keep the water hot.

(i) Explain how the foam helps to keep the water hot.

(2)

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* (ii) A company has developed a new material which they think could be used instead of foam around the cylinder.

Devise an investigation they could carry out to make a fair comparison of the insulating properties of their new material with those of the foam.

(6)

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(Total for question = 8 marks)

Q2.

Answer the question with a cross in the box you think is correct ☒ . If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒ .

Which one of these is a renewable energy source?

(1)

- ☒ **A** coal
- ☒ **B** nuclear
- ☒ **C** oil
- ☒ **D** wind

(Total for question = 1 mark)

Q3.

(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)

Q4.

Figure 7 shows a skier going down a hill.

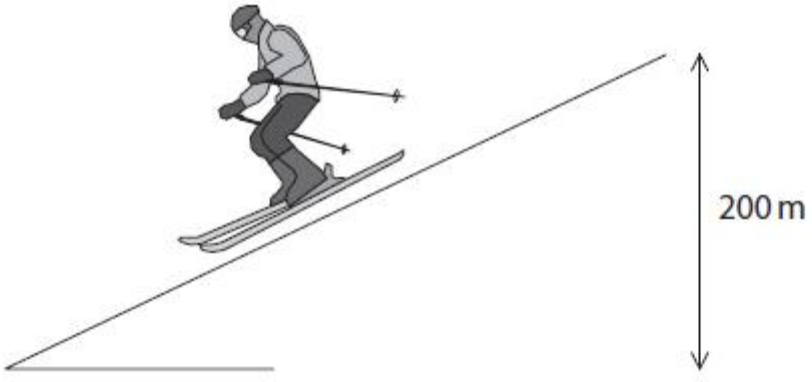

Figure 7

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

(Total for question = 5 marks)