

**Q1.**

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  .

Two cyclists ride on a hilly road.

The cyclists lubricated the chains and the wheel bearings of their bicycles before setting off.

Lubricating the chains and wheel bearings helps to

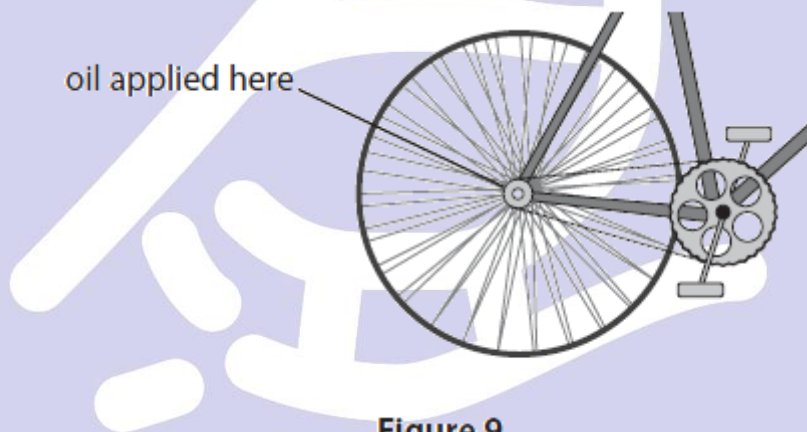
(1)

- A** decrease the amount of work done against gravity
- B** decrease the efficiency of the cyclist and bicycle
- C** increase the efficiency of the cyclist and bicycle
- D** increase the overall amount of energy transferred by the cyclist

(Total for question = 8 marks)

**Q2.**

Oil is applied to the wheel of a bicycle at the point shown in Figure 9.



**Figure 9**

Explain how the oil improves the efficiency of the bicycle.

(3)

.....

.....

.....

.....

.....

.....

.....

(Total for question = 5 marks)

**Q3.**

Explain how unwanted energy transfers may be reduced in mechanical systems.

(2)

.....

.....

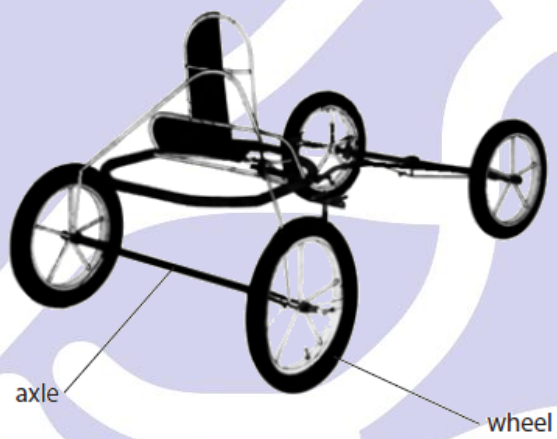
.....

.....

(Total for question = 2 marks)

**Q4.**

Figure 8 shows part of a cart.



**Figure 8**

When the wheels turn the axles become warm.

(i) Explain why the axles become warm when the wheels turn.

(2)

.....

.....

.....

(ii) Give **one** way of reducing the heating of the axles when the wheels turn.

(1)

.....

.....

(Total for question = 3 marks)