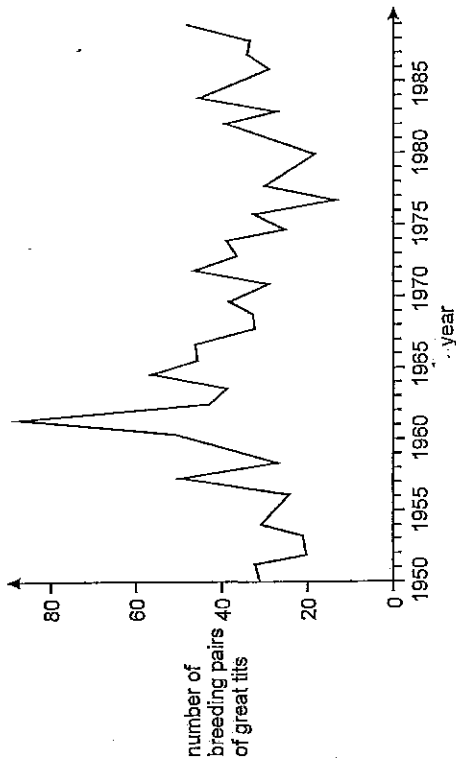


- (c) The graph shows how the number of pairs of great tits changed in the wood over a period of time.



Adapted from *Wytham Woods* by Dr C M Perrins, published in *The Biologist*, Volume 36, 1989

- (i) Use the graph to suggest the year when there were probably fewest sparrowhawks in the wood.

What is the evidence from the graph for your answer?

1 mark

- (ii) Explain the reasoning for the answer you have given in part (c) (i).

1 mark
Maximum 7 marks

12. (a) Megan was doing time-trials on her bike around a 400 metre horizontal track.

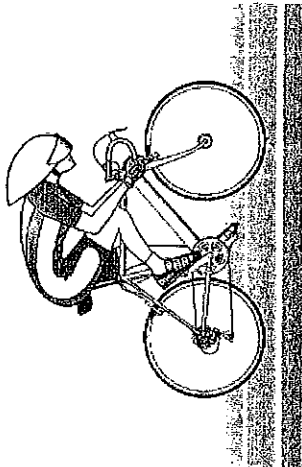
- (i) She took 32 seconds to travel 400 m.
What was her average speed? Give the unit.

1 mark

- (ii) Compare the forward force on the bike with the backward force on the bike when Megan was travelling at a constant speed.

1 mark

- (b) Megan then crouched down over the handlebars to make herself more streamlined, as shown below.
She continued to pedal with the same force as before.



Compare the forward and backward forces on Megan and her bike now.

1 mark

Explain your answer.

1 mark
maximum 4 marks

11. (a) Scientists studied the animals and plants in a large wood, over a period of time. One food chain in the wood is shown below.

oak trees → winter moth caterpillars → great tits → sparrowhawks

In the space below, draw a pyramid of numbers for this food chain.

2 marks

- (b) Insecticide was sprayed onto fields near the wood. Some of the insecticide was blown into the wood by the wind.

- (i) In the food chain above, the sparrowhawks contained the highest concentration of insecticide. Explain why.

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

2 marks

- (ii) The use of insecticides could cause the population of sparrowhawks to decrease. Give one other reason why the population of sparrowhawks might decrease.

.....
.....

1 mark