

## Trophic Levels & Ecosystems

**Total marks: 19**

**Q1.**

Figure 13 shows a food chain for organisms in a stream.



**Figure 13**

(i) In the food chain there is  $2.1 \times 10^4$  J of energy in the biomass of stonefly larvae. 90% of the energy is lost between each trophic level of the food chain.

Calculate the energy value that enters the birds.

(2)

..... J

(ii) State the impact of this energy loss on the length of the food chain.

(1)

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**(Total for question = 3 marks)**

Q2.

Figure 25 shows the mass of meat eaten in the world from 1980 to 2010.

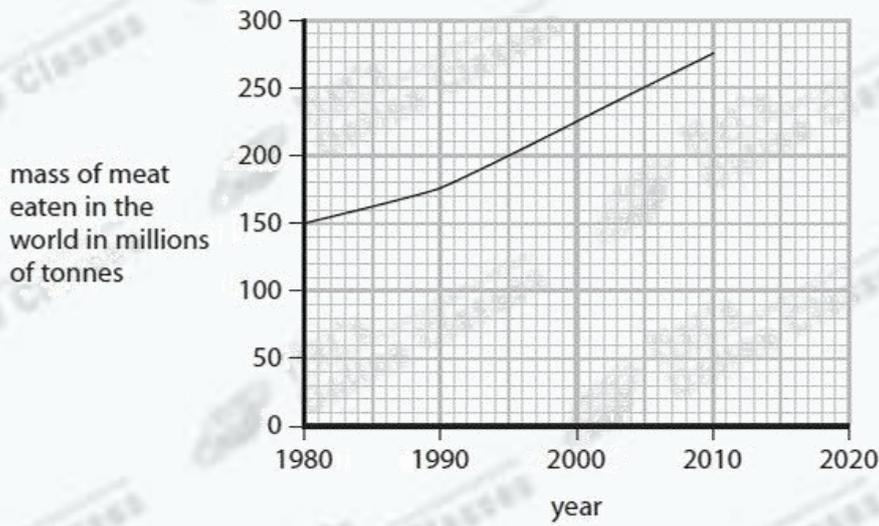


Figure 25

Calculate the rate of increase in the mass of meat eaten in the world from 2000 to 2010.

..... millions of tonnes per year

(Total for question = 2 marks)

Q3.

A scientist investigated the distribution of invertebrates found in a garden.

Figure 10 shows 30 invertebrates that the scientist collected.



key					
beetle	snail	ant	spider	slug	worm

(i) Complete the table by filling in the tally and number for the spiders and worms.

(2)

invertebrate	tally	number of invertebrates
ant		6
beetle		10
slug		2
snail		3
spider		
worm		

(ii) The scientist selected an invertebrate at random to observe it in more detail.

State the probability that the invertebrate selected is an ant.

Give your answer in its simplest form.

(2)

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(iii) State how the type of food used to bait the pitfall trap could affect the number of different invertebrates caught.

(1)

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**(Total for question = 5 marks)**

**Q4.**

A scientist investigated the distribution of invertebrates found in a garden.

The scientist also counted the number of snails in four 1m<sup>2</sup> areas of the garden.

The garden had a total area of 40 m<sup>2</sup>.

Describe how the scientist can use this information to estimate the number of snails in the garden.

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**(Total for question = 2 marks)**

Q5.

Plankton, krill and cod are found in the Arctic ocean.

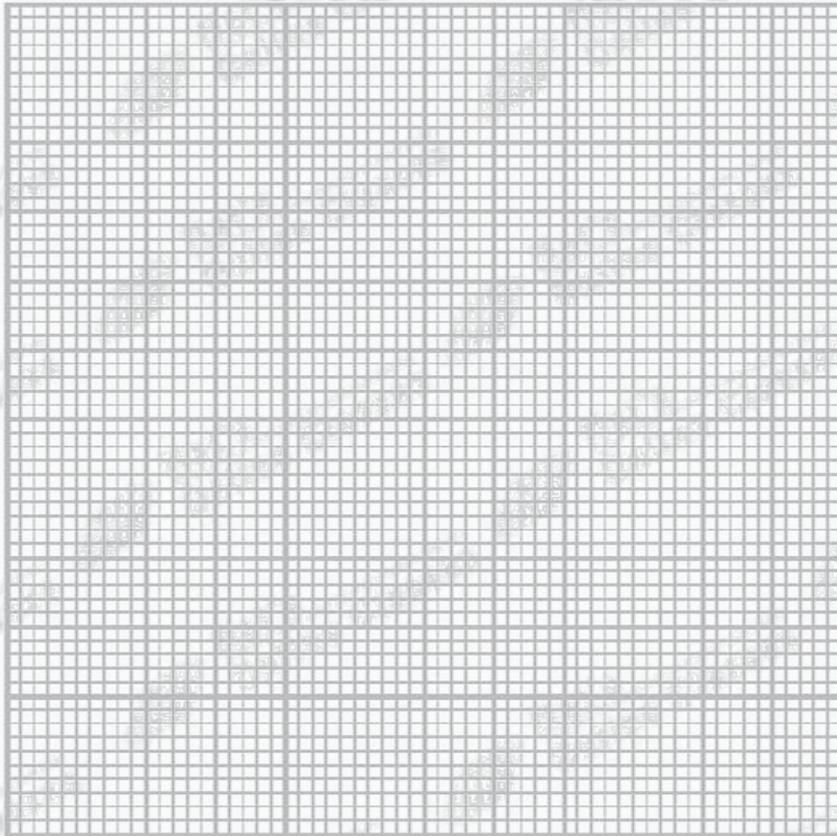
Figure 5 shows the mass of organisms in an area of the Arctic ocean.



Figure 5

(i) Draw an accurate pyramid of biomass for this food chain.

(2)



(ii) Give **two** reasons why all the biomass from the krill is not transferred to the cod.

(2)

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2 .....

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(Total for question = 4 marks)

Q6.

Algae are green plants.

Figure 10 shows the number of algae in a lake in the United Kingdom during one year.

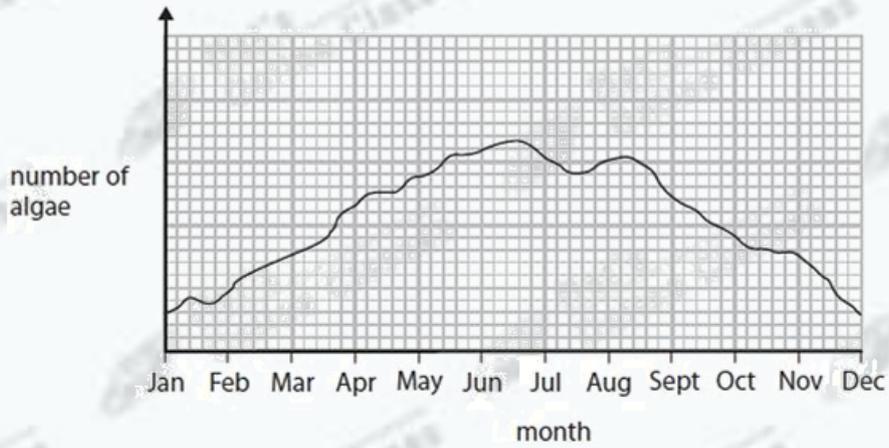


Figure 10

Explain the changes in the number of algae in the lake from February to June.

(3)

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(Total for question = 3 marks)