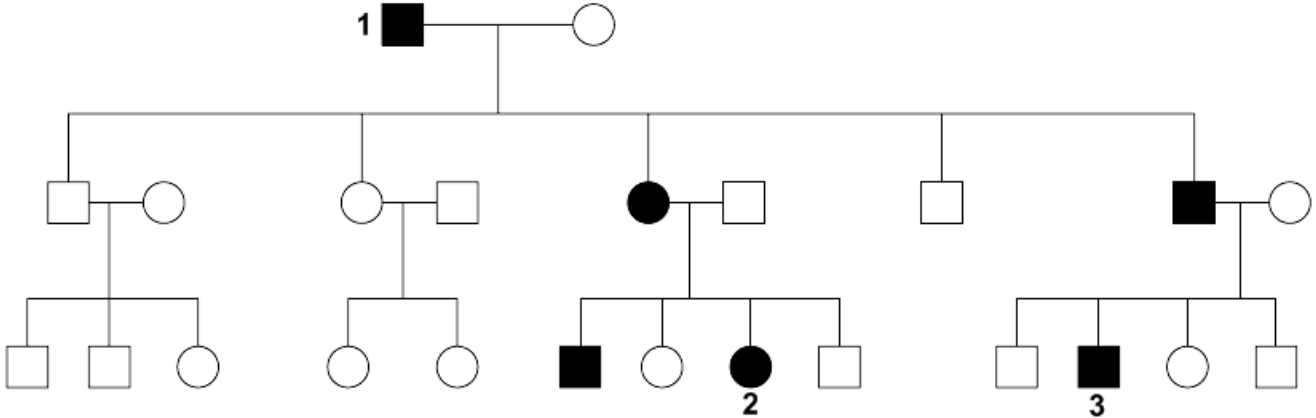
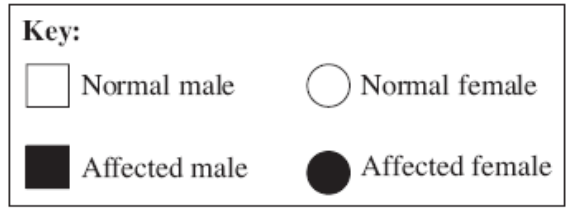


Biology

Question 1. The family tree below shows the inheritance of webbed toes in a human family.
 The presence of webbed toes is due to a dominant allele **R**.
 The recessive allele, **r**, gives normal toes.



1.1 Write down the genotype of the affected male number 1.

.....

(1 mark)

1.2 Give two reasons for your answer.

.....

(2 marks)

2.1 In the space below construct a Punnett square to show a cross between woman 2 and man 3.



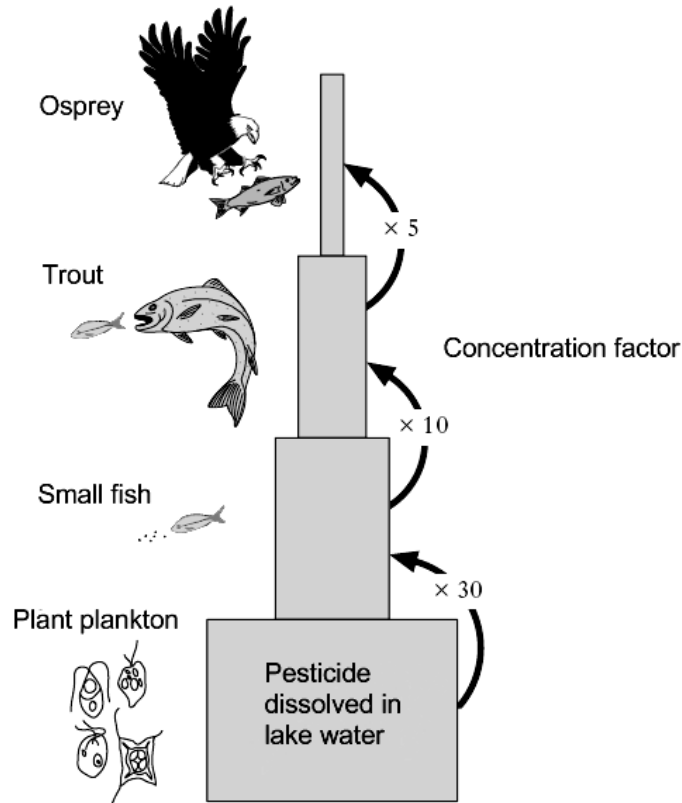
(2 marks)

2.2 What is the probability of the appearance of webbed toes in the children from the above cross?

..... %

(1 mark)

Question 2. The diagram shows how a non-biodegradable pesticide passes through a food chain in a fresh-water lake.



1. Describe **one** way in which the pesticide could get into the lake water.

.....

.....

(1 mark)

2.1 The diagram shows the number of times the pesticide becomes concentrated at each stage of the food chain.

If the concentration of pesticide in the plant plankton is 0.025 ppm what would be the expected concentration in the osprey?

Space for calculation

.....ppm

(2 marks)

2.2 Explain why pesticide becomes more concentrated in carnivores at the top of the food chain.

.....

.....

.....

(2 marks)

Question 3. The table below shows terms used to describe some types of organisms found in ecosystems.

1. Complete the table by indicating with a tick (✓) the trophic level(s) which match term. The first one has been done for you.

	Trophic level 1	Trophic level 2	Trophic level 3	Trophic level 4
Carnivore			✓	✓
Herbivore				
Primary consumer				
Producer				
Secondary consumer				
Tertiary consumer				

(4 marks)

Biology text books often state that:

- only 2 – 3% of the light energy reaching terrestrial ecosystems is fixed by plants;
- the energy transfer between trophic levels within an ecosystems is about 10%.

2. State two reasons why only 2 – 3% of the light energy reaching terrestrial ecosystems is fixed by plants.

1 -

2 -

(2 marks)

3. Comment the statement that the energy transfer between trophic levels within an ecosystems is about 10%.

.....

(2 marks)

4. The herbivores are mammals. Suggest why they lose to the environment about 80% of energy they receive, but the plants lose only 50% of their energy.

.....

(1 mark)