



Biology
Leaving Certificate
Ordinary Level

Past Exam Questions on
Ecology and Ecosystems

Q9 Section B 2013

9. (a) (i) In ecology, what is meant by the term *conservation*?

.....

(ii) Suggest why conservation is important in an ecosystem.

.....

.....

(b) (i) As part of your ecosystem study, you used various pieces of apparatus to collect animals for identification.

Draw labelled diagrams of **two** pieces of apparatus that you used to collect animals **and** in **each** case name the apparatus and an animal collected.

Name of apparatus 1..... Animal collected.....

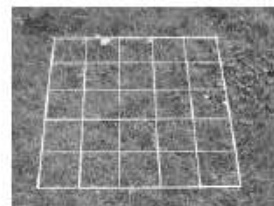
Labelled diagram of apparatus 1.

Name of apparatus 2..... Animal collected.....

Labelled diagram of apparatus 2.

(ii) Name the piece of apparatus shown.

.....



(iii) What is this piece of apparatus used for in your ecology studies?

.....

.....

Q11 Section C 2013

11. (a) Explain the following terms as used in ecology:

- (i) Producer.
- (ii) Niche.
- (iii) Habitat.

(9)

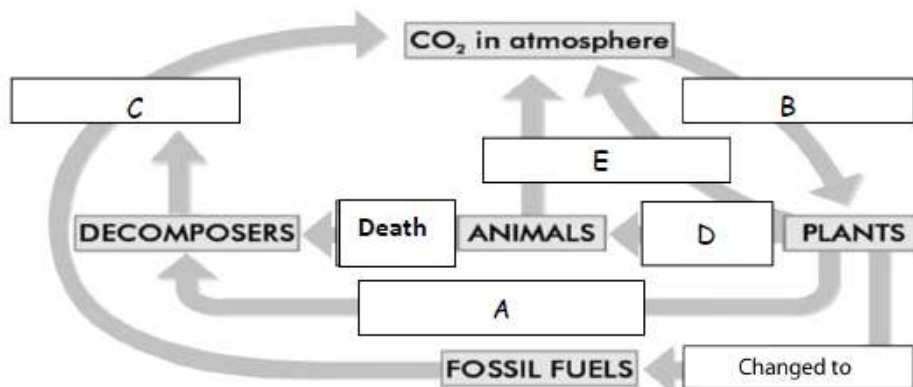
(b) Climate Change

There is now widespread evidence that the emission of greenhouse gases into the earth's atmosphere is causing global climate change. Major changes are expected in terms of temperature and rainfall. One of the main greenhouse gases is carbon dioxide, released when fossil fuels are burned. Another is methane gas released by cattle. These gases cause pollution of the air. They are called greenhouse gases as they have an effect similar to that of a greenhouse - they prevent some of the sun's heat escaping back into space.

- (i) Name **one** greenhouse gas.
- (ii) Why are greenhouse gases so called?
- (iii) What is meant by the term *pollution*?
- (iv) Suggest **one** way to reduce the levels of greenhouse gases in the air.
- (v) The diagram below shows the carbon cycle.

In your answer book match the terms from the list below to the letters A, B, C, D and E in the diagram.

List: Photosynthesis; Respiration; Eaten by; Combustion; Decay.



(27)

(c) Improper waste disposal may cause pollution.

- (i) State any **two** types of pollution associated with waste disposal.
- (ii) 1. Give **one** example of a waste associated with agriculture or forestry or fisheries.
2. State how the named waste is managed.
- (iii) Give **three** ways to minimise waste.
- (iv) Give **one** example of the use of micro-organisms in waste management.

(24)

Q5 Section A 2012

5. Place each term from the following list into **Column B** to match a description in **Column A**.
The first one has been completed as an example.

List: Pollution; Niche; Recycle; Burning fuel; Conservation; Smell.

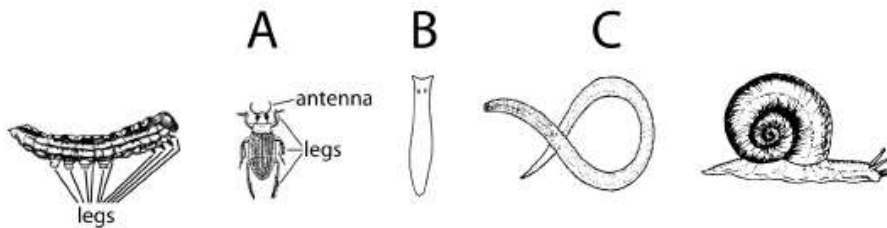
Column A	Column B
The role of the organism in the habitat.	Niche
(a) Any harmful addition to the ecosystem.	
(b) A problem associated with waste disposal.	
(c) A way to minimise waste.	
(d) Wise management of an ecosystem.	
(e) A possible cause of pollution.	

Q10 Section C 2012

10. (a) Using organisms from the ecosystem you have studied, draw a pyramid of numbers to show at least **three** feeding levels.

(9)

- (b) (i) All organisms in an ecosystem are influenced by biotic and abiotic factors.
Explain the underlined words.
- (ii) Name any **two** abiotic factors from an ecosystem you have studied and describe how you measured **each one**.
- (iii) Keys may be used to identify animals. Use the following key to identify animals A, B and C.
The animals are not drawn to scale.



- | | |
|---|----------------------|
| 1. Animal has a shell..... | <i>Helix.</i> |
| Animal does not have a shell..... | Go to 2. |
| 2. Animal has legs..... | Go to 3. |
| Animal does not have legs..... | Go to 4. |
| 3. Animal has three pairs of legs..... | <i>Tribolium.</i> |
| Animal has more than three pairs of legs..... | <i>Pieris larva.</i> |
| 4. Animal has long rounded body..... | Nematode. |
| Animal has flat body with two eye spots..... | Planarian. |

- (iv) All organisms are adapted to their own habitat.
- Name **one** animal from the ecosystem you have studied.
 - Describe **one** way in which it is adapted to its habitat.

(27)

- (c) (i) Distinguish between a quantitative and a qualitative survey by writing a sentence about each.

- (ii)
- Name **one** plant from the ecosystem you have studied.
 - Describe how you carried out a quantitative survey to determine its frequency.

- (iii) As a result of pollution, a species of plant disappears from an ecosystem.
Suggest **two** possible effects that the disappearance of this plant might have on the other plants and animals living in the area.

(24)

Q2 Section A 2011

2. (i) What is meant by *pollution*?

(ii) Name **one** human activity that causes pollution.

(iii) State **two** problems associated with waste disposal in Ireland.

Problem 1. _____

Problem 2. _____

(iv) List **two** ways of minimising waste.

1. _____

2. _____

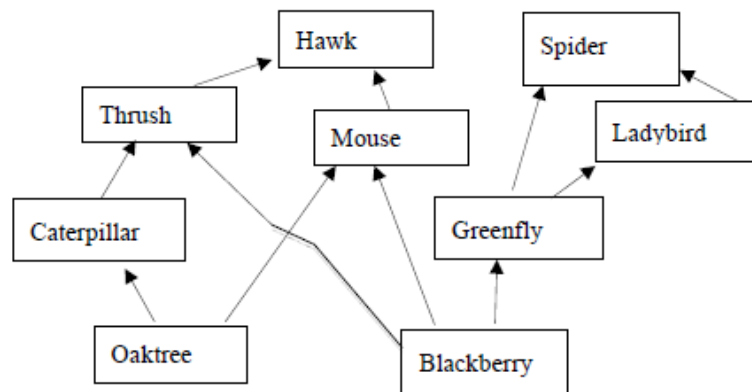
(v) Give **one** example of the use of microorganisms in waste management.

Q11 Section C 2011

11. (a) (i) What is the main source of energy in an ecosystem?
 (ii) Explain the following terms used in ecology:
 1. Biosphere
 2. Habitat.

(9)

- (b) The food web below was drawn by a group of students following their field work. Study the web and answer the questions.



- (i) Name **one** primary producer from the web.
 (ii) Name **one** herbivore **and** **one** carnivore from the web.
 (iii) Name **one** omnivore from the web.
 (iv) What would happen to the number of caterpillars if all the thrushes died?
 (v) What is meant by a *quantitative* survey of organisms in a habitat?
 (vi) Name **two** pieces of apparatus used to collect animals from an ecosystem.

(24)

- (c) Read the paragraph below and answer the questions that follow.

Shedding Daylight on Irish Bats.

There are ten species of bat in Ireland. They live in our houses, churches and old buildings. The most common species of bat in Ireland is the Pipistrelle which is small enough to fit into a matchbox. The largest species is Leisler's bat. Bats are not blind. They use sound to navigate. Bats are the only flying mammals. They generally hunt at night for moths and other insects. In winter many bat species hibernate in underground sites and outhouses. Bats have only one baby per year and they can live for up to forty years. Barn owls may sometimes feed on bats, or they may fall prey to the domestic cat. According to Bat Conservation Ireland, bat populations are decreasing. This may be due to loss of hedgerows, pesticide use and the renovation of old buildings.

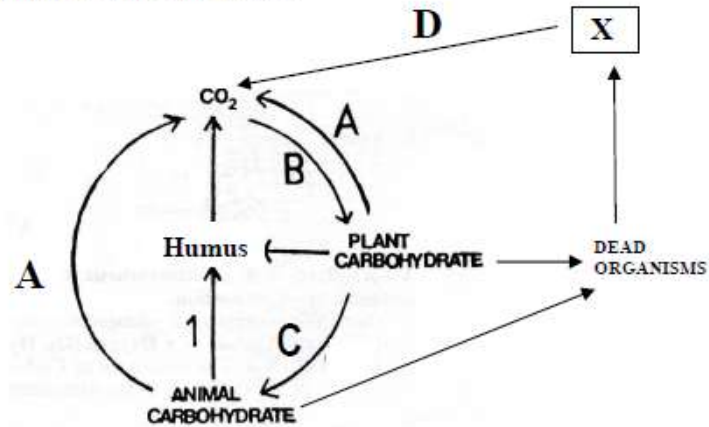
[Adapted from 'Science Spin' Issue 26, January 2008. By Anthony King.]

- (i) How many species of bat are found in Ireland?
 (ii) What is the name of the most common species found here?
 (iii) What do bats feed on?
 (iv) What is meant by the term *predator*?
 (v) Name a predator of Irish bats.
 (vi) Suggest **one** reason why many bats hibernate in winter.
 (vii) What is meant by the term *conservation*?
 (viii) Suggest **one** way to help bat conservation in Ireland.

(27)

Q1 Section A 2010

1. (a) The diagram shows the carbon cycle.



Name the processes A, B, C, and D.

A. _____ B. _____

C. _____ D. _____

(b) Name the substances labelled X. _____

(c) Why are elements recycled in nature? _____

(d) Name one group of organisms responsible for process 1 in the diagram. _____

Q10 Section C 2010

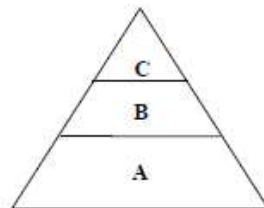
10. (a) In ecology we study ecosystems, habitats and communities, in which every organism has its own niche.

Explain what is meant by

- (i) *an ecosystem*
- (ii) *a habitat*
- (iii) *a niche.*

(9)

- (b) (i) Name an ecosystem you have studied and construct a simple food chain from that ecosystem.
- (ii) What is meant by a *trophic level*?
- (iii) Name the trophic levels A, B and C in the pyramid of numbers shown below.



- (iv) If all the organisms at C were removed (e.g. by disease) suggest what would happen to the organisms at B?

(27)

- (c) The great pressure put on wildlife by the growing human population has caused many species to become extinct. Habitat destruction, over-exploitation and environmental pollution have been the main causes.
- There is a clear need for conservation if such a trend is to be halted. Conservation has many practical outcomes from which humans will benefit in future years.

(Adapted from Advanced Biology, 3rd Edition, J. Simpkins, J. I. Williams)

- (i) Explain the underlined words from the passage.
- (ii) State the effect of any **one** named pollutant.
- (iii) Outline **one** conservation measure carried out by **one** of the following industries:
agriculture or forestry or fisheries.
- (iv) Name **one** problem associated with waste disposal.
- (v) State **one** role of microorganisms in waste management.

(24)

Q2 Section A 2009

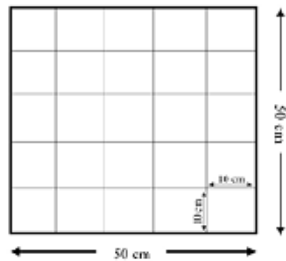
2. Choose each term from the following list and place it in **Column B** to match a description in **Column A**. The first one has been done as an example:

trophic level, niche, habitat, ecosystem, biosphere

Column A	Column B
Where an organism lives	habitat
All places where life is possible	
Organism's role in ecosystem	
Position in a pyramid of numbers	
Organisms and their environment	

Q10 Section C 2009

10. (a) (i) Distinguish between biotic and abiotic factors.
- (ii) An edaphic factor is an example of an abiotic factor. Explain the underlined term. (9)
- (b)



- (i) Distinguish between quantitative and qualitative surveys in an ecosystem.
- (ii) Name the piece of equipment shown above which is used in a quantitative study of an ecosystem.
- (iii) Why is the above piece of apparatus unsuitable for studying most animal populations?
- (iv) Suggest a plant that would not be suitable to survey using the above apparatus.
- (v) Outline how this piece of apparatus is used for studying plant populations
- (vi) How did you present your results?
- (vii) State **one** possible source of error in a survey of an ecosystem. (27)
- (c) Read the following extract and answer the questions that follow.

‘Invasion of the jellyfish: Mediterranean on alert as hundreds suffer from stings.’

As thousands of tourists head to the Mediterranean, their holiday enjoyment is being threatened by hordes of jellyfish. French emergency services received more than 500 calls for help in a single day. It is a pattern being repeated along the shores of Mediterranean. Much of the southern – and even northern – coastlines of Spain have been hit. Paddlers and swimmers suffered painful stings from a species commonly known as the mauve stinger.

When a person is stung the venom (poison) from the jellyfish stinging cells causes swelling, redness and oozing. The venom can also cause an allergic response. There is no anti-venom and vinegar is useless. Jellyfish have no autonomy of movement and are swept around the oceans by wind and tide. This is the eighth year in succession that they have stormed the smartest resorts in the Mediterranean.

[Article adapted from the Independent on Sunday (U.K.) 24th July 2008. By Matthew Kay in Paris, Elizabeth Nash in Madrid and Peter Popham in Rome.]

- (i) What is meant by the term *species*?
- (ii) Which species of jellyfish was involved in the invasion along Mediterranean shores?
- (iii) Name **one** country that has been affected by this invasion.
- (iv) Give **two** ways in which the jellyfish venom can affect a person.
- (v) Suggest why jellyfish produce a venom.
- (vi) These jellyfish are usually found in tropical waters. Suggest **one** reason for their increased occurrence in the Mediterranean in recent years.
- (vii) What do you think is meant by the phrase “Jellyfish have no autonomy of movement”?

(24)

Q1 Section A 2008

1. The following food chain is from a hedgerow.

hawthorn leaves → caterpillar → blue tit → sparrowhawk

Complete any four of the following by reference to this food chain.

- (a) The primary consumer in this food chain is _____
- (b) If the number of sparrowhawks increases, the number of blue tits may _____
- (c) In this food chain the hawthorn leaves represent the _____
- (d) Name a carnivore from this food chain _____
- (e) The number of trophic (feeding) levels in this food chain is limited by the small transfer of _____ from one level to the next.

Q10 Section C 2008

10. (a) (i) What is meant by nitrogen fixation? (9)
- (ii) Name a group of organisms involved in nitrogen fixation.
- (b) Answer the following questions by reference to an ecosystem that you have studied.
- (i) Name the ecosystem.
 - (ii) Name **two** habitats from the ecosystem.
 - (iii) Name an animal that is present in **one** of these habitats and describe **one** way in which it is adapted to that habitat.
 - (iv) Describe briefly how you carried out a quantitative survey of a **named** plant found in the ecosystem. (27)
- (c) (i) What is meant by pollution?
- (ii) Give an example of pollution which may result from domestic (household) or industrial or agricultural activity.
- (iii) Suggest **two** ways to prevent or control pollution.
- (iv) Write a short paragraph (about 5 lines) on waste management. (24)

Q2 Section A 2007

2. Choose a term that is used in ecology from the following list and place it in column A to match the description in column B. The first one has been completed as an example.

predator, habitat, biosphere, niche, ecosystem

Column A	Column B
Predator	Kills and eats other animals
	All parts of the earth and its atmosphere where life exists
	A community of organisms and their environment
	The role of an organism in an ecosystem
	Place where an organism lives

Q9 Section B 2007

9. (a) (i) What is meant in ecology by a quantitative survey?

.....
.....

(ii) What is a quadrat frame?

.....
.....

(b) Answer the following questions in relation to a quantitative survey of plants that you carried out.

(i) How did you use the quadrat frame to carry out the survey?.....

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

(ii) Why did you use a number of quadrats or use the quadrat frame a number of times?

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

(iii) How did you identify the plants?

.....
.....

(iv) How did you present your results?

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

(v) Is the quadrat method suitable for animal populations?

Explain your answer

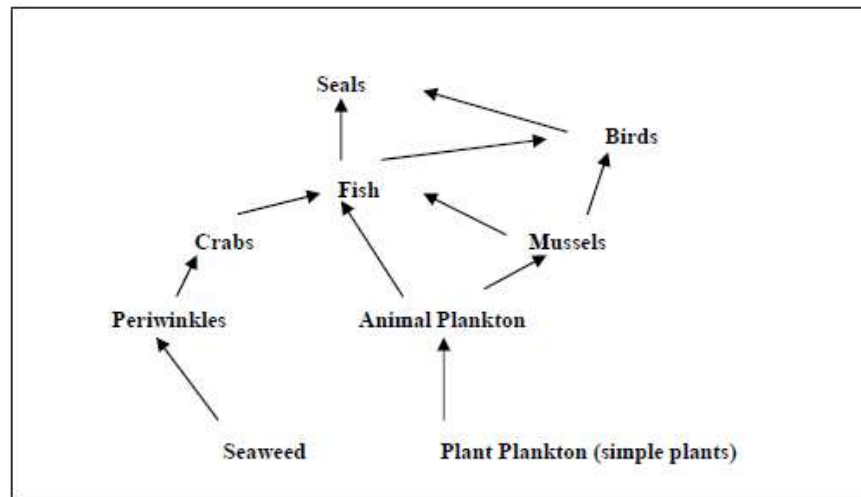
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Q10 Section C 2007

10. (a) (i) What is the principal source of energy for the Earth's ecosystems?
(ii) Name the process that converts this energy into chemical energy in plants. (9)

(b) Answer the following questions in relation to the food web shown in the diagram.

- (i) Name a producer.
(ii) What does the animal plankton feed on?
(iii) What feeds on the animal plankton?
(iv) Why are periwinkles referred to as primary consumers?
(v) Starting with a producer, complete a food chain with **four** trophic (feeding) levels, naming each organism involved. (24)



(c) Answer the following questions in relation to a named ecosystem you have investigated.

- (i) Name the ecosystem.
(ii) Describe how you collected a **named** animal.
(iii) State one way in which a **named** organism was adapted to the ecosystem.
(iv) What is meant by an abiotic factor?
(v) Give **two** abiotic factors that you investigated.
(vi) In relation to the abiotic factors you have named, describe how you measured each one. (27)

Q1 Section A 2006

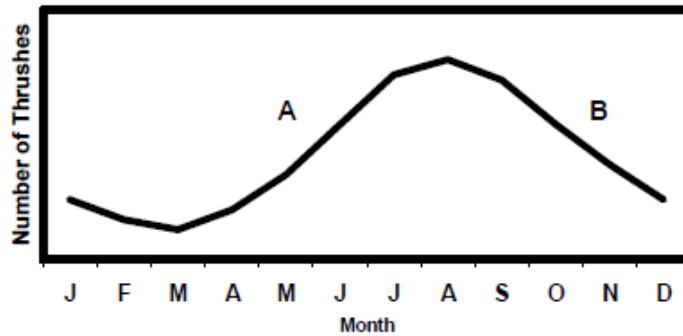
1. Use your knowledge of ecology to answer **four** parts of the following.
 - (a) An organism which makes its own food is called a(n)
 - (b) An organism that eats another organism is called a
 - (c) The place where an organism lives is called its
 - (d) The primary source of energy in an ecosystem is the
 - (e) The parts of the earth and atmosphere in which life is found is called the

Q8 Section B 2006

8. (a) (i) What is meant in ecology by a **quantitative** survey?
-
-
- (ii) What is a **quadrat frame**?
-
- (b) (i) In the case of a **named** plant describe how you would carry out a **quantitative** survey in the ecosystem that you have studied.
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- (ii) Describe how you recorded the results of your survey.
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- (iii) Suggest a possible source of error in your study.
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-

Q10 Section C 2006

10. (a) (i) What is a pyramid of numbers?
 (ii) Using organisms from the ecosystem that you have investigated draw a pyramid of numbers to show at least **three** trophic (feeding) levels. (9)
- (b) Study the graph, which shows how the number of thrushes in a wood changes in the course of a year, and then answer the following questions.



- (i) What does the graph tell you about the number of thrushes?
 (ii) Suggest **one** reason for the change in the number of thrushes at A.
 (iii) Suggest **two** reasons for the change in the number of thrushes at B.
 (iv) Would you expect similar changes in numbers for other small birds in the wood? Explain your answer. (27)
- (c) Answer the following in relation to waste management in Ireland.
 (i) Waste management is becoming an increasingly difficult matter. Suggest **two** reasons for this.
 (ii) Describe **one** method of waste management by reference to agriculture, fisheries or forestry.
 (iii) Suggest some ways of minimizing waste. (24)

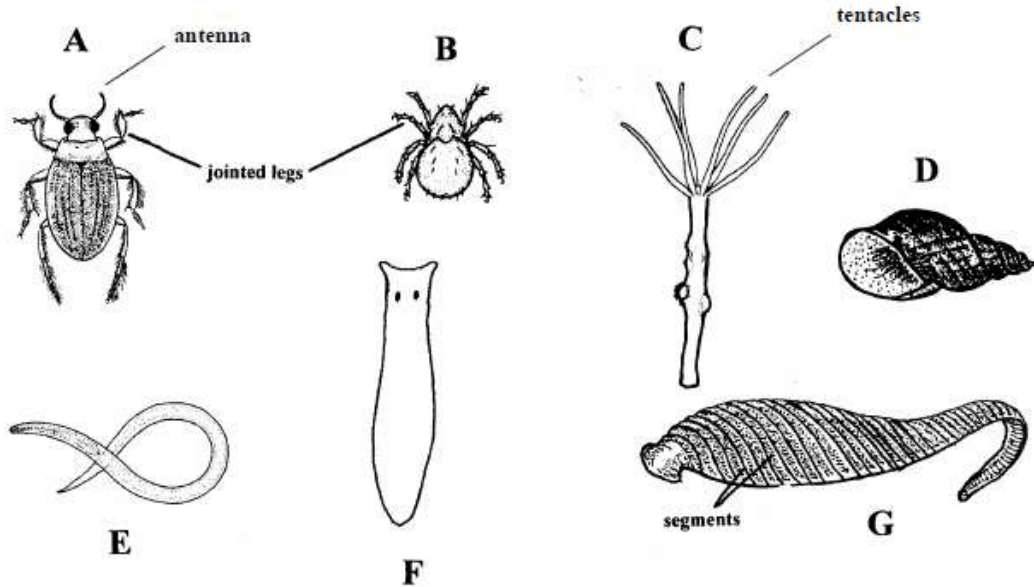
Q1 Section A 2005

1. Explain **four** of the following terms that are used in ecology.

- (a) Biosphere
- (b) Habitat
- (c) Consumer
- (d) Producer
- (e) Niche

Q10 Section C 2005

10. (a) (i) What is an ecosystem?
 (ii) Name two ecosystems found in Ireland. (9)
- (b) Animals A, B, C, D, E, F, G were found in a small lake. They are not drawn to the same scale. Use the following key to identify each of these animals. Write down each letter and the animal it represents in your answer book. (21)



1.	Jointed legs present	2
	Jointed legs absent	3
2.	Three pairs of jointed legs	Diving beetle
	Four pairs of jointed legs	Water mite
3.	Body divided into segments	Leech
	Body not divided into segments	4
4.	Shell present	Pond snail
	Shell absent	5
5.	Ring of tentacles around the mouth	Hydra
	No tentacles	6
6.	Flat body with eye spots	Planarian
	Round body with pointed ends	Nematode

- (c) (i) What is meant by pollution?
 (ii) Describe a human activity that may result in pollution. Suggest a way in which this pollution could be prevented.
 (iii) What do you understand by the term conservation?
 (iv) Suggest three reasons for conserving wild animals and plants. (30)