

WARNING: You must return this section with your answer book otherwise marks will be lost.

Write Your
Examination
Number here

AN ROINN OIDEACHAIS

19934

LEAVING CERTIFICATE EXAMINATION, 1997

BIOLOGY — ORDINARY LEVEL

WEDNESDAY, 18 JUNE — AFTERNOON 2.00 to 5.00

Answer **six** questions from Part I and **four** questions from Part II.

You should not spend more than 45 minutes on Part I, leaving about 135 minutes for Part II.

PART I (120 marks)

Answer **six** questions. Each question carries 20 marks.

Write your answers in the spaces provided.

Keep your answers short.

Write your examination number at top.

Be sure to return this part of the examination paper; enclose it in the answer book you use for answering Part II.

1. Answer *four* of the following:

- (a) The pigment found in red blood cells is called
- (b) Excess water is removed from *Amoeba* by a structure called the
- (c) The structure that allows food and oxygen to pass from a mother to the embryo in a mammal is called the
- (d) The pollen in a flowering plant is produced by the
- (e) The organ in which the pacemaker is located is the

2. Select the words from the following list which most closely match those in column 1. Write your choice in column 2 opposite the appropriate word in column 1.

snail, rat, earthworm, *Spirogyra*, moss, insect, yeast

Column 1

Column 2

Arthropod

.....

Alga

.....

Fungus

.....

Mollusc

.....

Mammal

.....

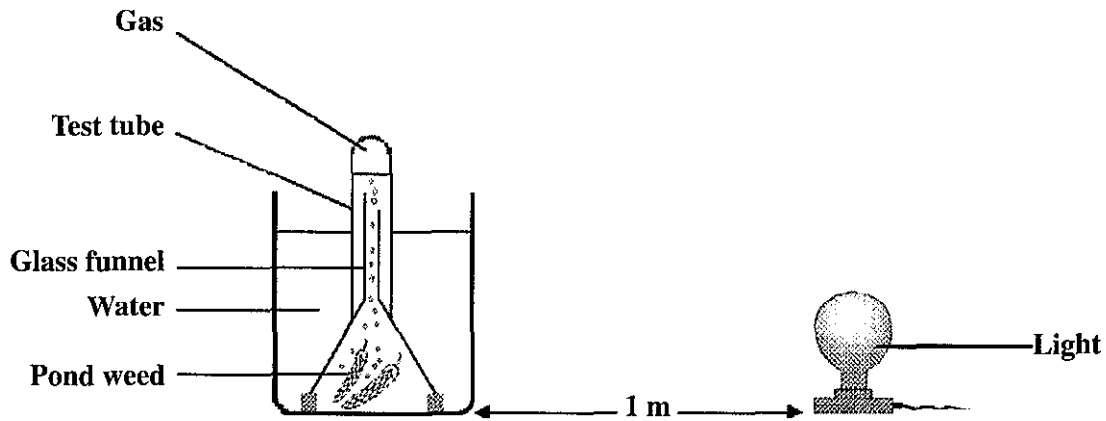
Annelid

.....

Bryophyte

.....

3. The diagram shows an experiment to investigate the effect of light on some pond weed.



What is the name of the process being investigated?

Name the gas collected in the tube.

State two ways by which you could increase the rate of gas production by the weed.

- (i)
- (ii)

State two reasons that the weed might be important for the animals living in a pond.

- (i)
- (ii)

4. Answer the following by placing a tick (✓) in the box of your choice.

- (a) Which two parts of the human body are joined by the eustachian tube?
- | | | | |
|------------------------|--------------------------|-------------------------|--------------------------|
| (i) mouth and stomach | <input type="checkbox"/> | (ii) kidney and bladder | <input type="checkbox"/> |
| (iii) ovary and uterus | <input type="checkbox"/> | (iv) ear and throat | <input type="checkbox"/> |
- (b) All the members of the *same species* of an organism living in a habitat are called:
- | | | | |
|--------------------|--------------------------|------------------|--------------------------|
| (i) a population | <input type="checkbox"/> | (ii) a community | <input type="checkbox"/> |
| (iii) an ecosystem | <input type="checkbox"/> | (iv) a food web | <input type="checkbox"/> |
- (c) Which one of the following diseases is NOT caused by a microbe (bacterium, virus)?
- | | | | |
|--------------------|--------------------------|----------------|--------------------------|
| (i) chicken pox | <input type="checkbox"/> | (ii) influenza | <input type="checkbox"/> |
| (iii) tuberculosis | <input type="checkbox"/> | (iv) scurvy | <input type="checkbox"/> |
- (d) Two hormones found in the human body are:
- | | | | |
|----------------------------|--------------------------|-------------------------|--------------------------|
| (i) insulin and thyroxine | <input type="checkbox"/> | (ii) insulin and pepsin | <input type="checkbox"/> |
| (iii) thyroxine and pepsin | <input type="checkbox"/> | (iv) pepsin and trypsin | <input type="checkbox"/> |
- (e) Which one of the following is used to test for protein?
- | | | | |
|--------------------|--------------------------|----------------------|--------------------------|
| (i) Fehling's test | <input type="checkbox"/> | (ii) Iodine test | <input type="checkbox"/> |
| (iii) Biuret test | <input type="checkbox"/> | (iv) Benedict's test | <input type="checkbox"/> |

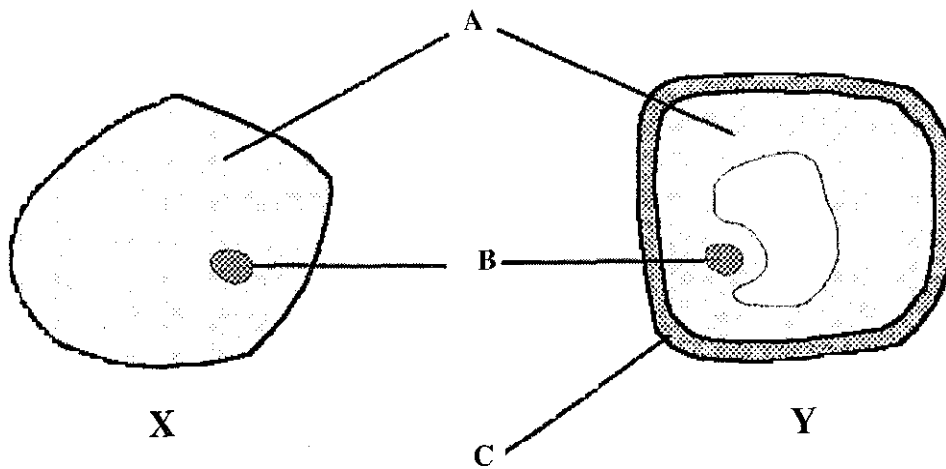
5. Complete the following statements by writing the correct words in the spaces provided.

- (a) There are four different types of tooth found in the human mouth — incisors, premolars, molars and
.....
- (b) Cells may divide by two methods — mitosis produces two new cells and meiosis produces
new cells
- (c) Arteries transport oxygenated (scarlet) blood, except the artery which carries
de-oxygenated (purple) blood.
- (d) The pale fluid, consisting of 90% water, in which the blood cells are suspended, is called.....
- (e) The principal stages of animal nutrition are ingestion, digestion,, assimilation,
and egestion.

6. Indicate whether each of the following statements is true or false by putting a circle around the appropriate letter T or F.

	True	False
Example. <i>Amoeba</i> is a protozoan.	<input checked="" type="radio"/> T	<input type="radio"/> F
(a) Vitamin A is essential for healthy eyesight.	<input type="radio"/> T	<input type="radio"/> F
(b) Hydrophytes are plants found growing in dry places only.	<input type="radio"/> T	<input type="radio"/> F
(c) Herbivores have no incisor teeth.	<input type="radio"/> T	<input type="radio"/> F
(d) Sexual reproduction in <i>Spirogyra</i> is called conjugation.	<input type="radio"/> T	<input type="radio"/> F
(e) Spiders have 8 legs and insects have 6 legs.	<input type="radio"/> T	<input type="radio"/> F
(f) Urine leaves the bladder and passes to the outside via the ureter.	<input type="radio"/> T	<input type="radio"/> F
(g) Cellulose is found in all animal cells.	<input type="radio"/> T	<input type="radio"/> F
(h) Bacteria that cause disease are called pathogens.	<input type="radio"/> T	<input type="radio"/> F
(i) Lenticels are small pores on the stem of a plant.	<input type="radio"/> T	<input type="radio"/> F
(j) All viruses are parasites.	<input type="radio"/> T	<input type="radio"/> F

7. The diagrams below show a typical plant cell and an animal cell.



Which diagram (X or Y) shows the plant cell?.....

State two reasons for your choice.

(i)

(ii)

Name the structure labelled A.....

Name the structure labelled C.....

Name the coiled thread-like structures that might be found in B.

Which letter on the diagrams shows where DNA might be found?

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Part I is on a separate sheet which provides spaces for your answers. The completed sheet should be enclosed in your answer book.

PART II (280 marks)

Write your answers to this part in your answer book.

Answer **four** questions. Each question carries 70 marks.

8. (a) (i) Draw a large diagram of a named insect-pollinated flower. Label six structures on your diagram.
- (ii) Give two reasons that seed dispersal is important for plants. Using named examples, describe two methods of seed dispersal. (37)
- (b) (i) Water is lost from a plant's leaves through microscopic pores called stomata. What is the name given to this process?
- (ii) Describe an experiment to show that there are more stomata on the lower surface of a leaf than on the upper surface.
- (iii) State three environmental factors that would increase the loss of water from the leaves of a plant.
- (iv) What would you use a potometer for in the laboratory? (33)

9. (a) Amylase is an enzyme that digests starch. A student performed an experiment to investigate the effect of temperature on amylase activity. She measured the amount of starch digested, at six different temperatures, by a given amount of the enzyme in 30 minutes. The results of the experiment are shown below.

temperature °C	0	5	10	20	30	40
amount of starch digested (mg)	0	1	2	4	8	16

- (i) Plot the results using graph paper.
- (ii) What result would you expect if the experiment had been performed at 70 °C? Explain your answer.
- (iii) Where in the human body might amylase be found?
- (iv) Name a product formed when amylase digests starch.
- (v) Starch is a carbohydrate. Name two other carbohydrates.
- (vi) What three chemical elements make up a carbohydrate? (37)
- (b) Distinguish between aerobic and anaerobic respiration. Write a balanced chemical equation for aerobic respiration.
- Describe an experiment to show that a small animal produces carbon dioxide gas by aerobic respiration. (33)

10. (a) List three functions of the skeleton.

Give an example of (i) a ball and socket joint and (ii) a hinge joint. How does the movement in a ball and socket joint differ from that in a hinge joint?

State one difference between a tendon and a ligament.

Describe an experiment to demonstrate the mineral component of a bone. (42)

(b) Draw a diagram to show the structure of a neuron and label five parts.

What is meant by a reflex action? Describe, with the help of a labelled diagram, the pathway of the nervous impulse when your hand accidentally touches a hot object. (28)

11. (a) (i) Water is essential for all living things. State three ways in which a mammal might lose water, and two ways by which water may be replaced.

(ii) Describe an experiment to show the process of osmosis. State one reason that osmosis is important for living organisms. (31)

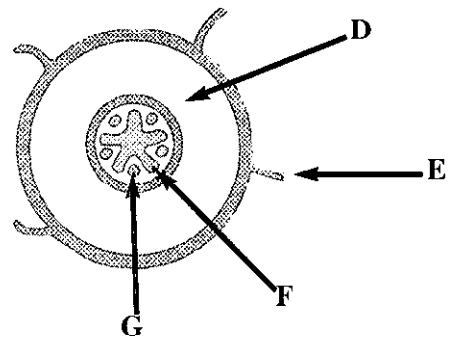
(b) The outline diagram is that of a transverse section of a young root. Which letter on the diagram shows the region that:

(i) absorbs water from the soil?

(ii) transports water to the stem?

(iii) brings food from the stem to the root?

(18)



(c) Draw an outline diagram of a transverse section through the stem of a young dicotyledon and label the following parts — xylem, phloem, cambium, epidermis.

State two ways in which a section through the stem of a monocotyledon differs from a section through the stem of a dicotyledon. (21)

12. (a) (i) What is meant by the following terms — gamete, fertilisation?

Why does sexual reproduction produce variety in the offspring?

Name an animal that can reproduce by asexual means.

(ii) State two ways by which plants can reproduce asexually (vegetatively).

State two advantages and two disadvantages of asexual reproduction in plants. (32)

(b) In a certain animal species the gene for black body (B) is dominant to the gene for grey body (b), and the gene for short hair (S) is dominant to the gene for long hair (s).

State the genotype of the following animals:

(i) an animal heterozygous for both body colour and hair type.

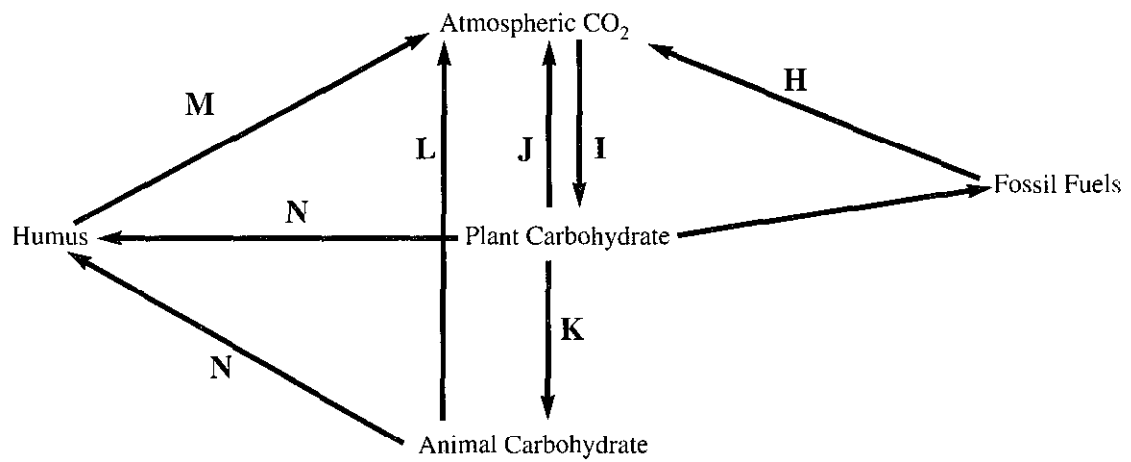
(ii) an animal with a grey body and long hair.

What body colour and hair type would the following animals have?

(i) Bbss (ii) bbSs (iii) BbSs

What four possible gametes could the animal BbSs produce? (38)

13. (a) The diagram below shows an outline of the carbon cycle.

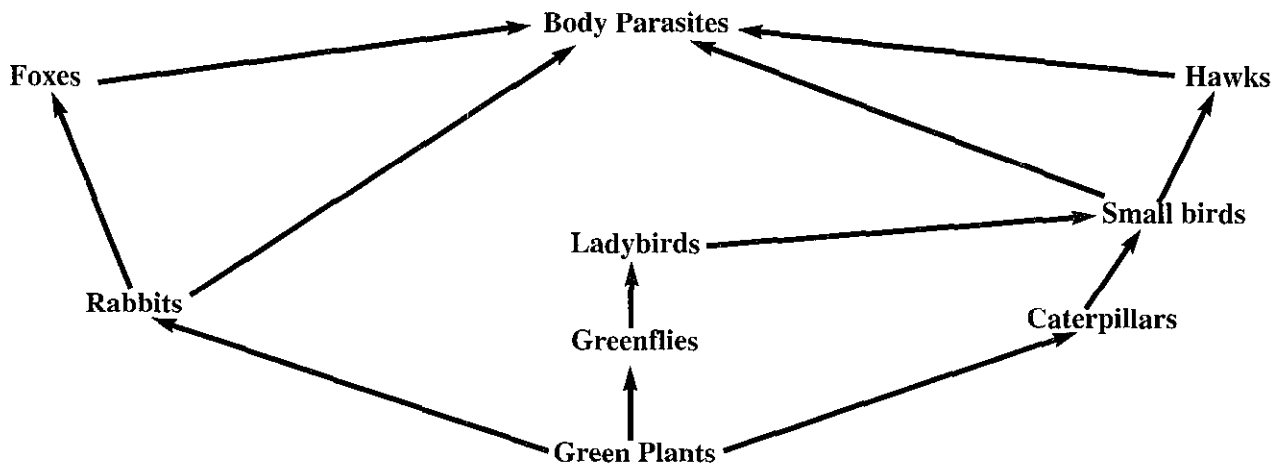


Which letter(s) on the diagram correspond(s) to the following processes?

- | | | | |
|--------------------------------|------------------------|----------------------|-------------------------|
| (i) death | (ii) combustion | (iii) photosynthesis | (iv) animal respiration |
| (v) micro-organism respiration | (vi) plant respiration | (vii) animal feeding | |

What do you understand by the term "greenhouse effect"? Why are many scientists worried about this effect?

(32)



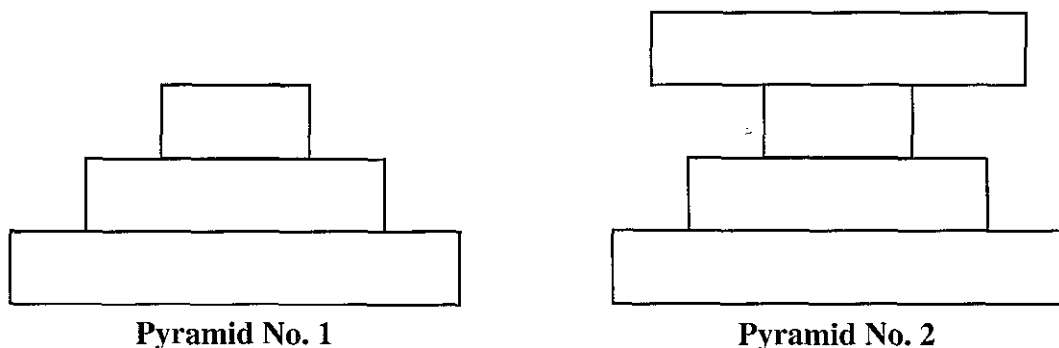
(b) From the diagram of the food web shown above, answer the following:

- Name two herbivores
- Name two carnivores
- Name a top carnivore.

Why are ladybirds regarded as a gardener's friends?

Copy out two food chains given in the diagram above that correspond to the two pyramids of numbers given below.

(38)



14. (a) The bread mould (*Rhizopus*) is a saprophyte and the potato blight fungus (*Phytophthora*) is a parasite. Explain the underlined terms.

Draw a labelled diagram to show the structure of the fungus *Rhizopus*. (27)

- (b) Mosses and ferns show an Alternation of Generations in their life cycles. Explain the underlined term.

Both these groups of plants produce spores and not seeds. State two differences between a spore and a seed such as a pea.

Mosses and ferns require water in order to complete their life cycles. In the case of one of these plant groups, explain why this is so. (21)

- (c) Describe an experiment to show that water is necessary for a seed to germinate. (22)

15. Answer *two* of the following: (35, 35)

- (a) Explain the term fossil. Outline the principles on which Darwin based his Theory of Evolution.

- (b) State the function of each of the following parts of the human eye:

(i) retina (ii) iris (iii) cornea

Explain the terms long-sightedness, short-sightedness. Show how each of these two eye defects can be corrected.

- (c) Explain the terms (i) ecdysis, (ii) metamorphosis.

Distinguish between complete and incomplete metamorphosis in the life cycles of insects, and give an example of a named insect in each case.

Name one insect in each case that shows each type of life cycle.

Using named examples, state four ways in which insects have an economic importance for humans.

- (d) What is meant by the term humus? State two reasons that humus is important for a fertile soil.

Describe an experiment to calculate the percentage weight of humus in a fresh soil sample.

Apart from humus and soil particles, list two components of soil.