Write your Examination Number here

AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1988

0034960

BIOLOGY—ORDINARY LEVEL

WEDNESDAY, 15 JUNE—MORNING, 9.30 to 12.30

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.

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1. Answer *four* of the following.
   (*a*) Saliva contains the enzyme .....

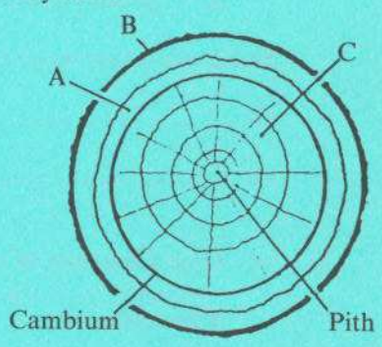
   (*b*) An organism which feeds on dead organic matter is called .....

   (*c*) The vertebral column protects the .....

   (*d*) Gas exchange between a leaf and the atmosphere takes place through the .....

   (*e*) Name a plant normally propagated by a stem tuber. .....

2. The diagram shows the arrangement of tissues in a transverse section of a woody stem.
   Name the parts labelled A, B, C.



   A .....

   B .....

   C .....

   How many years growth are shown in the section? ..... years
   State two ways in which the part labelled C is adapted to its functions.

   (1) .....

   .....

   (2) .....

   .....

   The cambium is a meristematic tissue. State its functions.

   .....

   .....

3. Give one major food source and one major function in the body for each of the following constituents of a balanced diet.

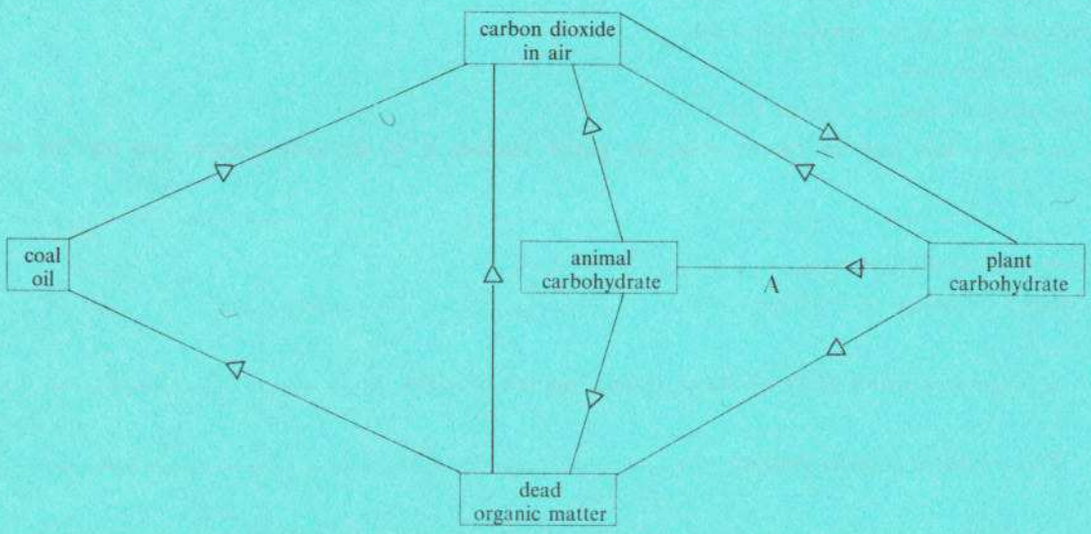
Constituent	Source	Function
Vitamin C	.....	.....
Iron	.....	.....
Carbohydrate	.....	.....

What is meant by the term balanced diet? .....

.....

.....

4. The diagram represents the carbon cycle.



Place the letters X, Y, Z on the correct arrows on the diagram to indicate the following:

X — respiration
Y — combustion
Z — photosynthesis

Name two other major processes that take place during A on the diagram.

(i) .....

(ii) .....

5. (*a*) Give a function of each of the following parts of the mammalian ear.

Eustachian tube .....

.....

Cochlea .....

.....

(*b*) State one location for each of the following in the mammalian body.

villus .....

synovial fluid .....

pacemaker .....

6. For each of the following, distinguish between the members of the pairs of terms by writing a brief explanatory note on each term.

(i) artery and vein .....

.....

.....

(ii) phototropism and geotropism .....

.....

.....

(iii) hibernation and perennation .....

.....

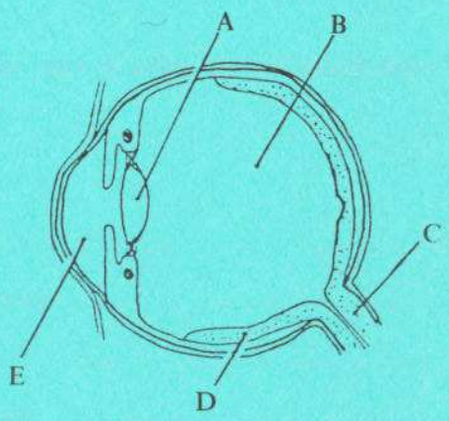
.....

(iv) egestion and excretion .....

.....

.....

7. The diagram shows a section through the eye.



Label A, B, C, D and E.

A .....

B .....

C .....

D .....

E .....

Mark with an X the structure that controls the amount of light entering the eye.

What is the function of C? .....

.....

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Part 1 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*) Describe a laboratory experiment to demonstrate the presence of bacteria in the air; include the precautions you would take to prevent contamination. (34)

(*b*) Draw a labelled diagram to show the structure of *Rhizopus*, the bread mould. Outline (i) asexual reproduction, (ii) the method of nutrition in *Rhizopus*. (36)

9. (*a*) Draw a diagram of a vertical section through a named insect-pollinated flower and label the parts.

Indicate on your diagram (i) where pollen is deposited by the insect during pollination, (ii) two parts that continue to develop after fertilisation.

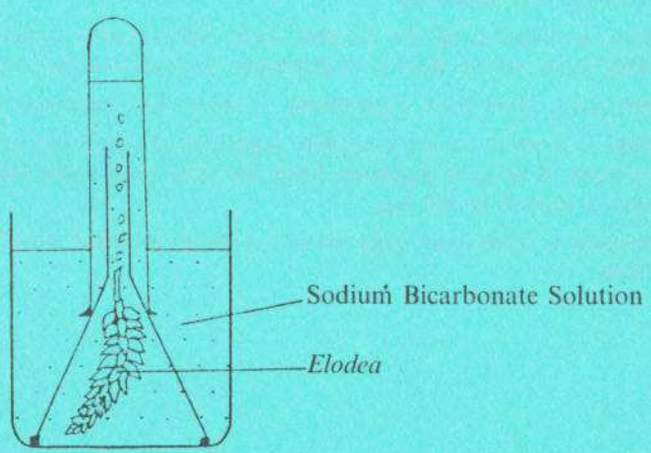
State three characteristics of an insect-pollinated flower that distinguish it from a wind-pollinated flower. (45)

(*b*) Name the phylum to which insects belong and give two external features that enable you to classify animals as members of that phylum. Give two other external characteristics that enables you to identify an animal as an insect. (25)

10. (i) Give an equation for photosynthesis and describe a laboratory experiment to show that chlorophyll is necessary for photosynthesis. (36)

(ii) The rate of photosynthesis in the waterplant *Elodea* was measured under different light intensities by counting the number of bubbles of gas produced per minute using the apparatus shown in the diagram.

The table shows the results of the experiment.



Relative light intensity	0	1	2	3	4	5	6	7
Number of bubbles of gas per minute	0	10	26	40	54	55	55	55

Draw a graph of these results on graph paper; put light intensity on the horizontal axis.

What is the general effect on the rate of photosynthesis of increasing the light intensity?

During the experiment the water plant was in a solution of sodium bicarbonate. Suggest a reason for this. (34)

11. (*a*) Draw a diagram of (i) a palisade cell of a leaf, (ii) an *Amoeba*, as seen using the light microscope and label the following; nucleus, cytoplasm, cell membrane.

Label two other parts present in the plant cell and not present in the animal cell.

State briefly a function of the nucleus and a function of the cell membrane. (31)

(*b*) What is understood by the terms (i) tissue, (ii) organ, in biology? Name one example in each case and state its main function. (24)

(*c*) Describe a laboratory experiment to demonstrate osmosis. (15)

12. Explain the terms (i) community, (ii) food web, (iii) producer, (iv) predation, as used in ecology. (24)

Name the habitat you have studied and describe an example of competition from the habitat.

Give a food web from the habitat and mention why all the sun's energy is not transferred through all the trophic levels.

Outline how one plant and one animal is adapted to spend winter in the habitat. (46)

13. Explain the following terms (i) genetics, (ii) diploid chromosome number, (iii) homologous chromosomes, (iv) dominance. (20)

In peas green seed (G) is dominant to yellow seed (g). A pea plant, pure-breeding for green seed, is crossed with a yellow-seeded plant. Find the genotypes and phenotypes produced in this cross and in the following F_2 generation ($F_1 \times F_1$); set out your answer as follows:

parents (P)

gametes

F_1

gametes

F_2 (26)

Compare, by means of labelled diagrams, metaphase of mitosis and metaphase I of meiosis. State *two* differences between mitosis and meiosis with regard to final products. (24)

14. Distinguish between sand, clay and loam soils.

Given a sample of a loam soil outline an experiment to find the relative proportions of gravel, sand, clay and humus present using a large measuring cylinder. If you added some lime to a similar cylinder of the soil mixture what additional observation might be made after some time? (40)

State briefly how the application of lime can improve the soil.

List four ways in which earthworms improve a soil.

Soil is formed as a result of weathering. Explain the term weathering and give one example of physical weathering and one example of chemical weathering in nature. (30)

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

(*a*) Draw a diagram of the human male reproductive system and label the following parts: scrotum, penis, testis, sperm duct (vas deferens), seminal vesicle, urethra. State two functions of the testes.

(*b*) Describe a laboratory experiment to show that germinating seed produce heat.

(*c*) What is formed on the complete digestion of a protein molecule? Outline the pathway taken by the products of protein digestion from the time they enter the bloodstream from the intestine until they reach a muscle in the leg.

(*d*) Describe a laboratory experiment to show the effect of different temperatures on the rate of enzyme action.