Write your Examination Number here

AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1977

BIOLOGY—ORDINARY LEVEL

FRIDAY, 17 JUNE—AFTERNOON, 2 to 4.45

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 120 minutes for Part II.

PART I (120 marks)

Answer **six** of the questions (1–7). 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 any *four* of the following.

(*a*) The structure separating the outer ear from the middle ear is the.....

(*b*) How many chromosomes are present, usually, in a fertilized human egg? .....

(*c*) Name *one* place in a young herbaceous dicotyledonous plant where a meristem is found.

.....

(*d*) The backbone of a mammal is made up of individual bones called.....

(*e*) Give an example of a non-endospermic dicotyledonous seed.....

2. In the spaces provided, write in whether you think each of the following statements is true or false.

(*a*) Tendons connect muscles to bones.

(*b*) Fungi are autotrophic organisms.

(*c*) Pollen is produced in the stigma.

(*d*) Bile is produced in the liver.

(*e*) The eustachian tubes connect the ears to the pharynx.

(*f*) The mammalian placenta allows a free flow of blood between mother and embryo.

(*g*) In plants respiration only occurs during the hours of darkness.

3. Name the blood vessels entering the right atrium (auricle) in the human.

.....

A person has a deep cut that is bleeding heavily. How can you tell from the bleeding whether a vein or an artery has been cut?

.....

.....

Where are the red blood cells formed?.....

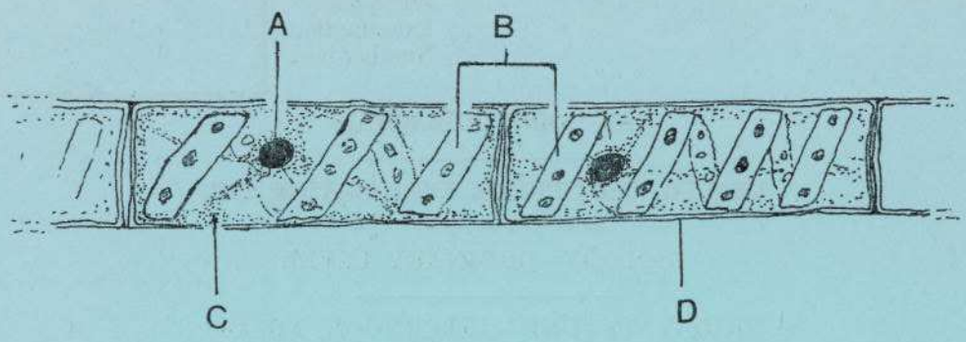
What is the function of valves in the blood circulatory system?

.....

State the difference between plasma and serum.

.....

4. (*a*) Identify the parts labelled A, B, C and D shown in the diagram.



A..... B.....

C..... D.....

Name the plant species shown. .....

State the group of plants to which it belongs. .....

Where is this plant to be found growing? .....

(*b*) State two structural differences between a typical animal cell and a cell of the plant shown above.

(i) .....

.....

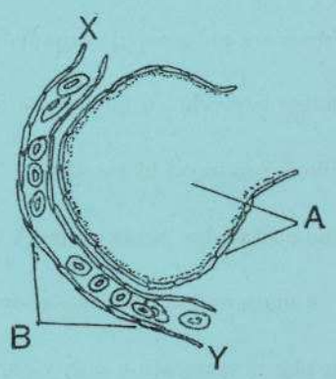
(ii) .....

.....

5. Identify the parts labelled A and B in the diagram of a section through lung tissue.

A .....

B .....



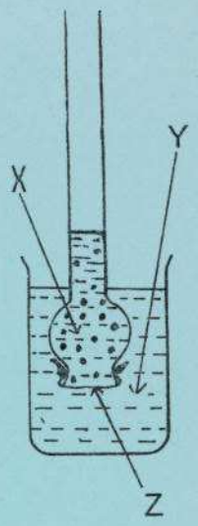
Blood from the heart arrives at X and flows to Y. From Y it flows back to the heart. Regarding each of the following substances state the change that takes place in the composition of the blood as it flows from X to Y.

Oxygen .....

Carbon dioxide .....

Water .....

6. (*a*) In an experiment apparatus was set up as shown in the diagram. What process is being demonstrated?



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Z represents a semi-permeable membrane. Explain semi-permeable membrane.

.....

.....

X represents a solution of sucrose and water and Y represents water. What change would be observed in the level of the liquid in the thistle funnel after, say, one hour?

.....

(*b*) Protozoans like *Amoeba* that live in freshwater habitats have contractile vacuoles but similar protozoans living in seawater generally do not have contractile vacuoles. Explain.

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.....

.....

7. (*a*) Where are the following to be found in the mammal?

sebaceous gland .....

cerebrum .....

(*b*) State what is meant by the following.

(i) metamorphosis .....

.....

(ii) adventitious roots .....

.....

(iii) peristalsis .....

.....

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

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

8. Explain the term transpiration. Describe, with the aid of a labelled diagram, an experiment to measure the rate of transpiration. List three environmental factors which affect the rate of transpiration and explain briefly the role played by each factor.

9. By means of a large labelled diagram, show the structure of the human eye. How does the eye control the amount of light entering it?

What is the function of (i) the lens, (ii) the retina? What is the cause of the defect of long-sightedness? How can the defect be corrected?

10. (*a*) List four common methods of preserving food and give the scientific basis for each.

(*b*) Distinguish between 'enzyme' and 'hormone'. Name three enzymes in the alimentary tract of man and state the function of each enzyme named.

Outline an experiment to demonstrate the effect of different temperatures on the speed of enzyme action.

11. (*a*) Use simple labelled diagrams to show a cell of four chromosomes (i) at anaphase stage of mitosis, (ii) at the anaphase I stage of meiosis. State where meiosis occurs in humans and in flowering plants.

(*b*) In cucumber plants the character non-bitter fruit (**n**) is recessive to the character bitter fruit (**N**).

If a plant homozygous for bitter fruit is crossed with a plant homozygous for non-bitter fruit show by diagrams that 3 : 1 is the ratio of bitter fruit to non-bitter fruit in the F_2 generation.

12. (*a*) Draw a labelled diagram of the reproductive system of the female mammal.

(*b*) What is meant by perennation? Give two similarities between perennation and hibernation. Draw a labelled diagram to show the structure of a bulb as seen in vertical section. Gardeners advise that the leaves should not be removed from a bulb for some time after it has been in flower. Suggest the biological reasoning in this advice.

13. (*a*) List the constituents of a fertile soil and outline the importance of any four of them for green plants. Describe a simple experiment to compare the capillarity of a sandy soil and a clay soil.

(*b*) Describe how you would show the effect of gravity on the direction of growth of plumules and radicles of bean seedlings. State briefly how the seedlings benefit from this response to gravity.

14. What is meant by respiration? Distinguish between aerobic and anaerobic respiration. Give the end-products of anaerobic respiration (i) in yeast, (ii) in muscle.

Describe with the aid of a diagram an experiment to show the production of carbon dioxide by a small mammal. Comment briefly on any modification necessary in this experiment if a green plant is used instead of the mammal.

15. (*a*) Give the meaning of (i) succession, (ii) climax.

(*b*) Draw a simple map of a habitat you have studied. Describe the methods you used in obtaining information on the distribution of the plants and animals in the habitat.

Name five plants and five animals common in the habitat. Give one example of competition from amongst the plants *or* animals listed.

In the case of two of the plants and two of the animals listed point out some special features which would account for their success in the habitat.