

Write Your Examination Number here

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AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1992

BIOLOGY — ORDINARY LEVEL

WEDNESDAY, 17 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.

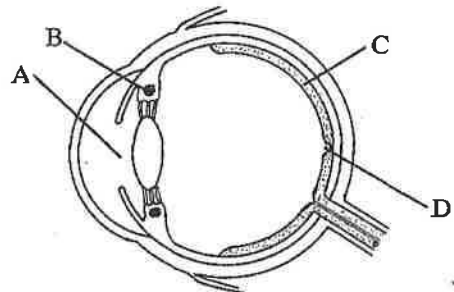
1. Answer four of the following.

- (a) How many pairs of legs have adult insects?
- (b) The organ mainly responsible for manufacture of urea is
- (c) A corm is a modified
- (d) Name a lignified tissue in flowering plants.
- (e) The cochlea is located in the

2. The diagram shows a section through the eye.

Name the parts labelled A, B, C, D.

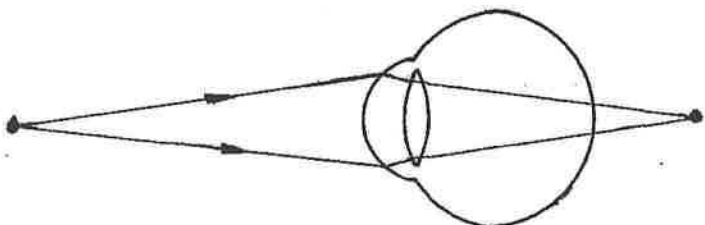
- A
- B
- C
- D



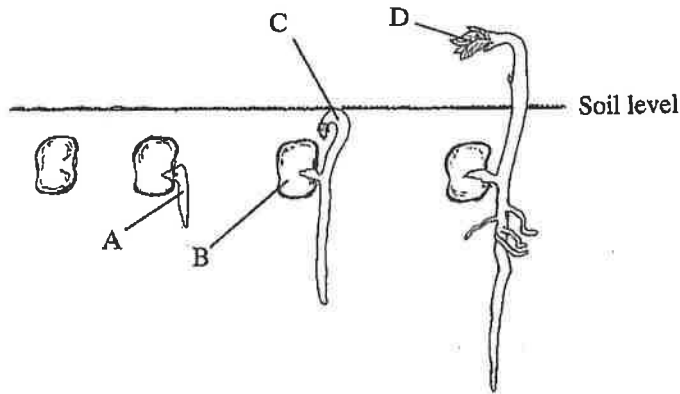
The retina contains two types of cell which detect light. Name one of these cell types.

.....

Complete the diagram by drawing in the type of lens used in glasses to correct the sight defect shown.



3. The diagrams show stages in the germination of a seed.



Name the parts labelled A, B, C, D.

A B
 C D

Is the type of germination shown hypogeal or epigeal?

State *two* conditions, in addition to warmth, which are essential for the germination of seeds.

(i) (ii)

4. The diagram shows apparatus set up in an experiment to investigate the effect of a deficiency of a mineral element on the growth of a species of plant.

The apparatus used in the experiment is light-proof. Suggest a reason for this.

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Why is it necessary to ensure that air is bubbled through the solution in the flask?

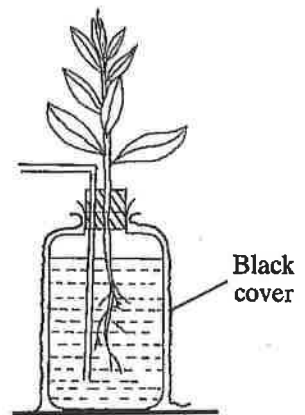
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What should you set up as a control for this experiment.

.....

Name a mineral element essential for

chlorophyll bone



5. The diagram shows a section through a knee joint.

Name the parts labelled A, B, C, D.

A

B

C

D

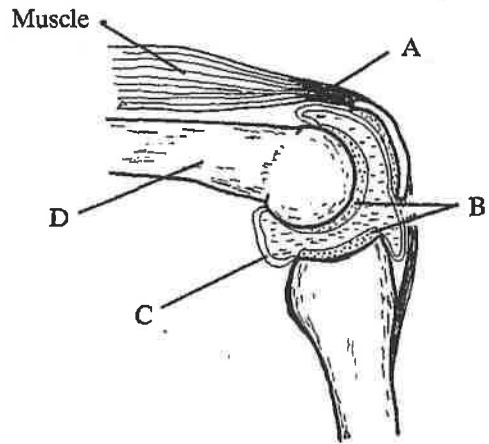
Indicate clearly on the diagram the position of the synovial fluid.

State the function of the synovial fluid.

.....

The knee joint is known as a hinge joint. Name one other type of joint found in the body.

.....



6. What is meant by immunity?

.....
.....

Distinguish between natural immunity *and* acquired immunity.

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

Give *two* ways by which white blood cells help protect the body.

(i)

.....

(ii)

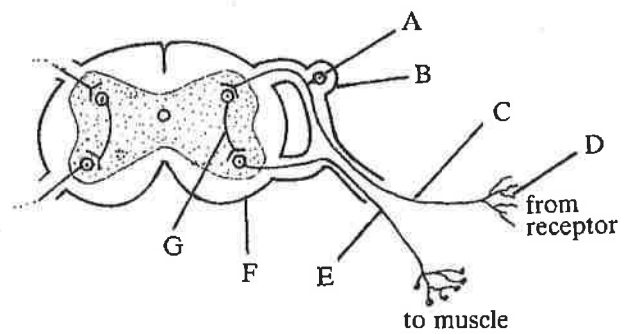
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P.T.O.

7. (i) The diagram represents a section through the spinal cord of a mammal to show a reflex arc.

Give the appropriate letter which indicates each of the following on the diagram.

	<u>letter</u>
Motor neuron
Dendrites
Spinal cord



(ii) The possibility of faster reflex actions through training is of great interest to people like football goalkeepers.

The graph shows the result of tests to see if repeated attempts would result in a faster reaction time.

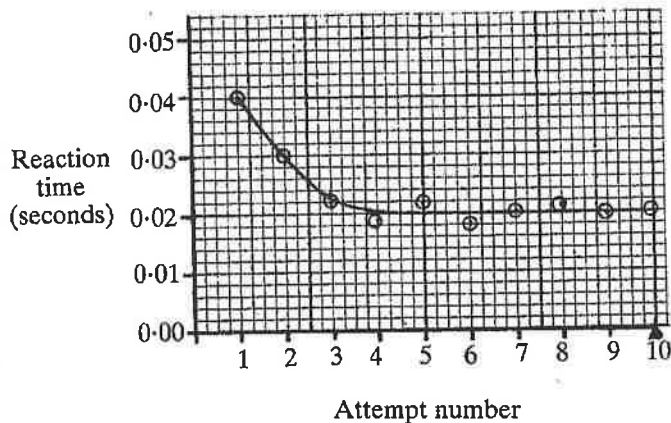
From the graph find

the fastest reaction time:

the slowest reaction time:

By how much was reaction time improved (if at all) by practice?

.....



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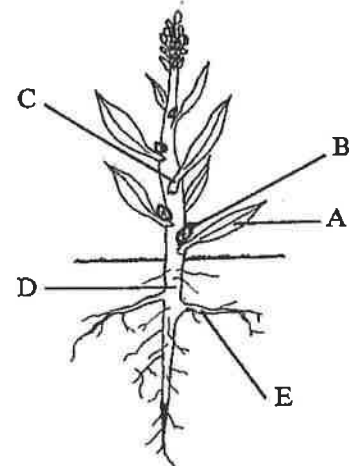
Part I is on a separate sheet which provides spaces for your answers. The completed sheet should be enclosed in your answer book.

PART II (280 marks)

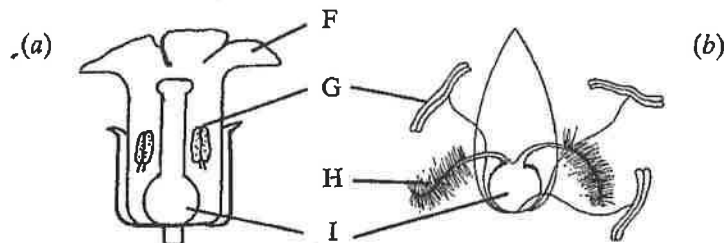
Write your answers to this part in your answer book.

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

8. (a) (i) Name the parts labelled on the diagram of a flowering plant.



- (ii) The diagrams show (a) a section through a primrose flower and (b) a flower from a grass.



Name the parts labelled.

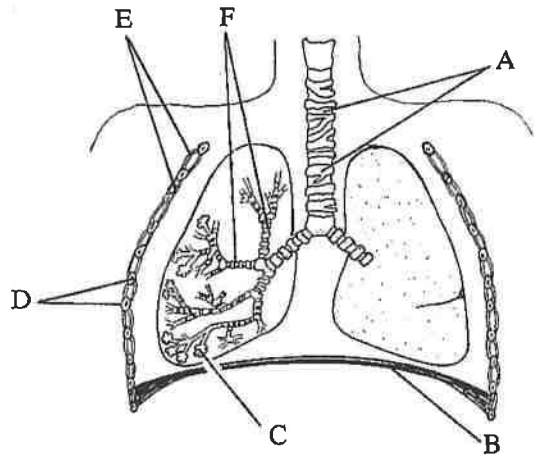
State which of the two flowers is wind pollinated giving *two* reasons for your answer based on the diagrams. (45)

- (b) Draw a large outline diagram of a transverse section through a young dicotyledonous root and label the following parts:

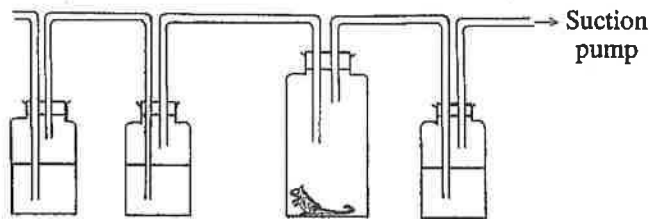
root hair, epidermis, cortex, xylem, phloem, endodermis (or pericycle). (25)

9. (a) The diagram shows the breathing apparatus in the human.

- (i) Name the parts labelled A, B, C, D, E, F.
- (ii) What is the function of the bands of cartilage on part A.
- (iii) Outline how parts B, D and E function during the inspiration of air.
- (iv) The parts labelled C have a large supply of blood capillaries on one side and a thin film of moisture on the other side.
How do these two features enable C to function?
(48)



(b) The diagram shows apparatus set up to investigate respiration.



Outline how you would use the apparatus and state the result you would expect to obtain. (22)

10. (a) Give a balanced chemical equation to summarise the process of photosynthesis.

In an experiment a plant with variegated leaves was placed in the dark for a period of 48 hours. The plant was then placed in a warm sunny situation for several hours. A leaf from the plant was then treated as follows:

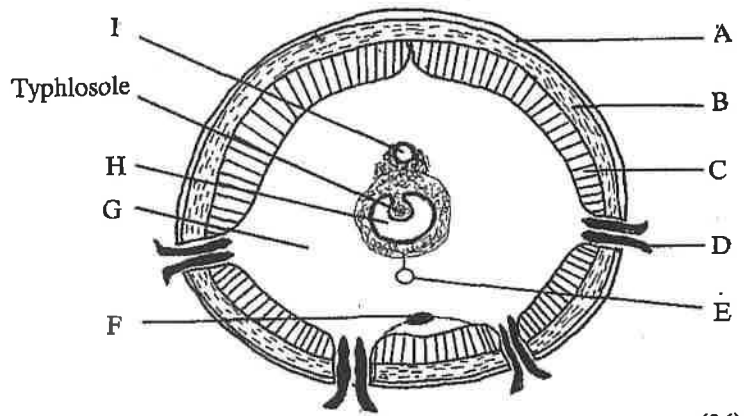
The leaf was plunged into boiling water for 30 seconds and then placed in hot alcohol for a time after which it was rinsed in warm water. The test for starch was then carried out:

- (i) What is a variegated leaf?
- (ii) Why was a variegated leaf used in this experiment?
- (iii) Why was the leaf placed in boiling water?
- (iv) Why was the leaf placed in hot alcohol?
- (v) Why was the leaf placed in warm water?
- (vi) Describe how you would carry out the starch test and the result you would expect in this experiment.
(42)

(b) Give a large-labelled diagram of a vertical section through a green leaf. (28)

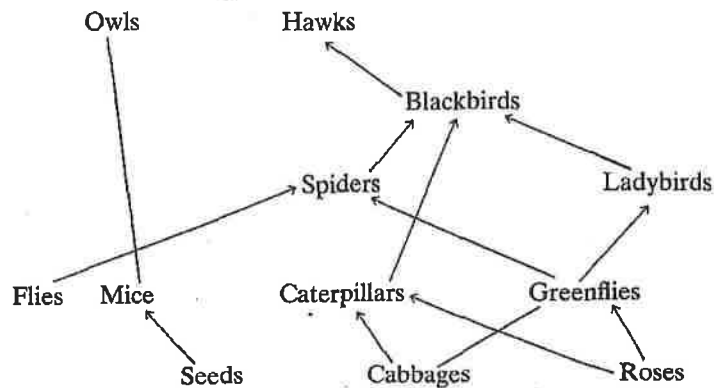
11. (a) (i) Name the phylum to which insects belong and give *two* characteristics common to members of that phylum.
- (ii) Explain the term metamorphosis and outline, using labelled diagrams, the complete metamorphosis of an insect (e.g. a butterfly) during its life cycle. (34)

- (b) (i) Name the phylum to which earthworms belong.
- (ii) The diagram shows a vertical section through an earthworm. Give the appropriate letter to identify each of the following parts on the diagram: chaetae (setae), body cavity (coelom), dorsal blood vessel, digestive system (alimentary canal), *two* layers of muscle.
- (iii) State briefly how an earthworm moves. (36)



12. (a) (i) Name six major components of soil.
- (ii) Give a labelled diagram of a Baerman (or Tullgren) funnel. State the purpose for which it is used and outline how it works. (36)

(b) The diagram shows a food web.

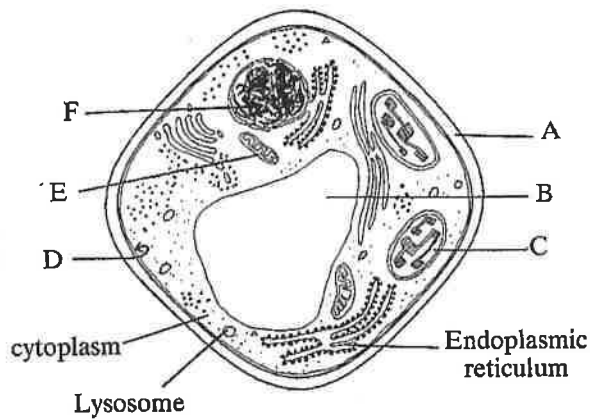


- (i) What is a food web?
- (ii) Give a food chain with four links in it from the above food web.
- (iii) Name a secondary and a tertiary consumer from the food web.
- (iv) Blackbirds are omnivores. What does this mean? What similar term can be applied to the owl? (34)

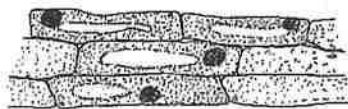
13. (a) The diagram shows a plant cell as seen using the electron microscope.

- (i) Name the parts labelled A, B, C, D, E, F.
- (ii) Give one function of each of the parts B, D, F.
- (iii) Give *three* major differences in structure between the cell shown in the diagram and a typical animal cell.

(36)



- (b) (i) Define the term diffusion. Suggest why it is said that osmosis is only a special case of diffusion.
- (ii) The diagram shows a few cells from a piece of onion epidermis and all the cells are turgid.



State what is meant by turgid and explain briefly how you would treat the cells so that they become plasmolysed. Draw one of the onion cells that has undergone plasmolysis.

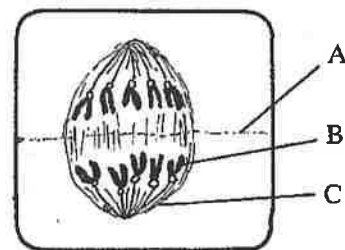
Salting meat is one method used to prevent bacteria causing decay. State how this method of preservation works.

(34)

14. (a) The diagram shows a stage in the process of mitosis in a cell.

- (i) Name the parts labelled A, B, C.
- (ii) Describe what is happening at this stage of mitosis.
- (iii) State *two* differences between mitosis and meiosis.
- (iv) State two places in a plant where mitosis occurs.

(40)



- (b) In peas green seed (G) is dominant to yellow seed (g). A homozygous green-seeded pea plant is crossed with a homozygous yellow-seeded plant. Show the genotypes and the phenotypes produced in this cross and in the following F₂ generation (F₁ × F₁). Set out your answer as follows: parents, gametes, F₁, gametes, F₂.

(30)

15. Answer *two* of the following.

(35, 35)

- (a) Draw a diagram of a vertical section through a tooth as seen seated in its gum and label the parts. Name *two* types of teeth in the human and state the particular function of each.
- (b) *Rhizopus* (the bread mould fungus) is a saprophyte and *Phytophthora infestans* (the potato blight fungus) is a parasite.
Explain the underlined terms.
Outline the life cycle of the parasite and give one method of control.
- (c) Give a labelled diagram of the reproductive system of the human female.
Explain each of the terms fertilization and menstruation.
Outline briefly the change that takes place in the uterus during menstruation.
- (d) What is an enzyme?
Describe an experiment to show that the rate of enzyme action is affected by temperature.