

Write your Examination Number here

AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1975

BIOLOGY—ORDINARY LEVEL

THURSDAY, 19 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 below.

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.

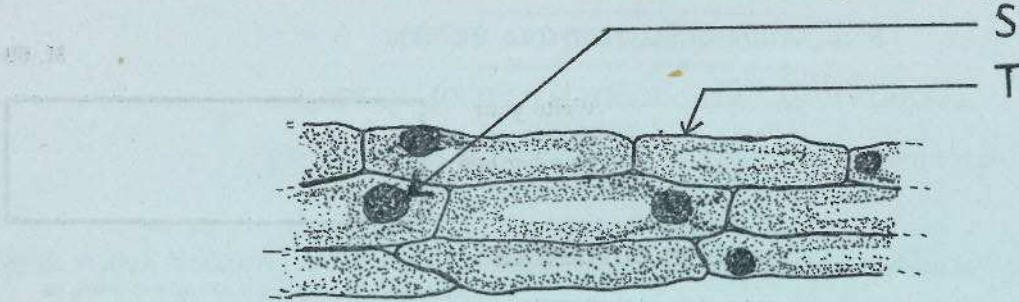
1. Answer five of the following.

- (a) Name the group of plants to which *Fucus* belongs.
- (b) The hepatic portal vein carries blood from the intestine to the
- (c) Name the principal photosynthetic pigment in plants.
- (d) Name an organism which can respire anaerobically.
- (e) Rickets can result from a deficiency of a vitamin. Name the vitamin.
- (f) What is the usual number of chromosomes in a human gamete (egg or sperm)?
- (g) In what part of the eye are the rods and cones located?

2. Using the letters P, S and H, indicate which of the following organisms are parasitic (P), saprophytic (S) or holophytic (H).

- Chlamydomonas*
- Mucor* (or *Rhizopus*)
- Liver fluke (or Tapeworm)
- Phytophthora infestans*
(Potato blight fungus)
- Buttercup

3. The diagram shows a piece of epidermis from an onion as seen through a microscope.



Name the parts S and T.

S..... T.....

Draw a similar diagram to show the appearance of a piece of onion epidermis after it becomes plasmolysed.

Diagram :

State how you would cause plasmolysis in a piece of onion epidermis.

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.....

4. (a) Name the organism shown in the diagram.....

Name the structure E.....

Indicate on the diagram which part is the gametophyte generation.

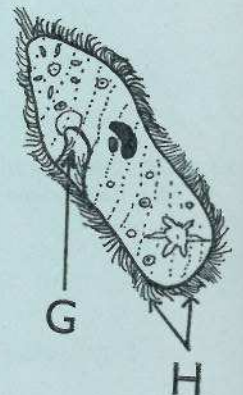


(b) Name the organism shown in the diagram.....

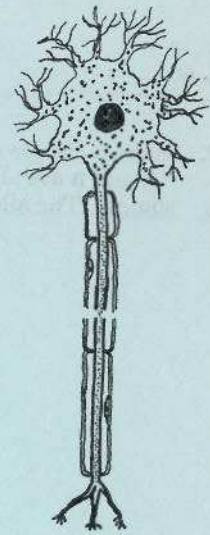
Give one function for each of the structures labelled.

G.....

H.....



5. (a) The diagram shows a motor nerve cell. State what is meant by "motor" in relation to nerve cells.



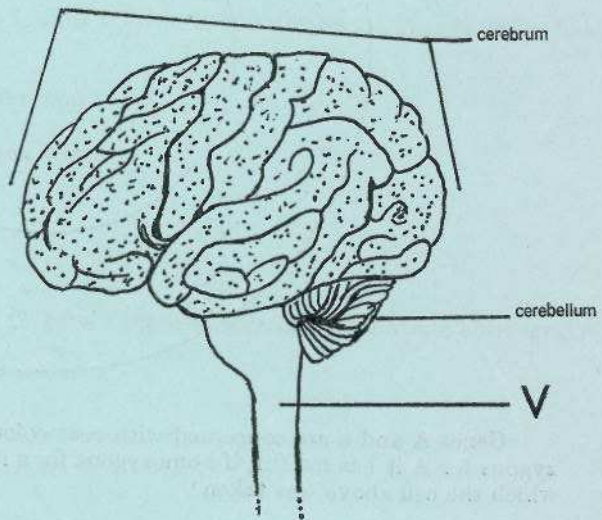
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Insert an arrow in the diagram to show the direction in which the nerve impulse travels.

(b) The diagram shows an external view of the human brain.

Insert the letters X, Y, and Z in the diagram to show in each case the area of the brain concerned with

- Vision (X)
- Hearing (Y)
- Speech (Z)



Name the structure V.....

6. What is the biological purpose for each of the following ?

(a) including very little carbohydrate in the diet of a person trying to lose weight:

.....
.....

(b) wearing spectacles with convex lenses:

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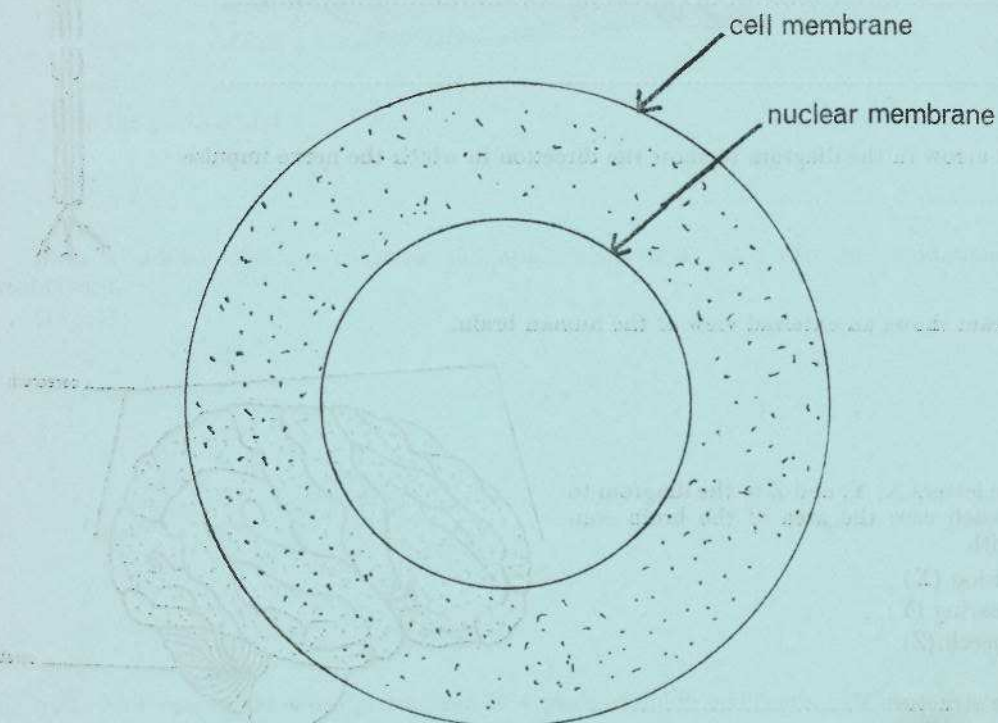
(c) eating a sweet or swallowing repeatedly when landing or taking off in an aeroplane:

.....
.....

(d) including much protein in the diet of a person undergoing a course of intensive physical training:

.....
.....

7. Make a simple drawing in the outline diagram of the animal cell below to illustrate the following statement. "A and a are allelic genes on one pair of chromosomes while B and b are alleles on another pair of chromosomes. The alleles Q and q occur in the same linkage group as B and b."



Genes **A** and **a** are concerned with coat colour and **A** is fully dominant over **a**. If the animal is homozygous for **A** it has red fur, if homozygous for **a** it has white fur. What is the phenotype of the animal from which the cell above was taken?

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

8. (a) State briefly what is meant by the living (biotic) environment and the non-living (abiotic) environment of an organism. Give one example of the dependence of a flowering plant on the living environment.
What is hibernation? Explain briefly how it is an adaptation to the environment.
- (b) In an experiment some soil was mixed with distilled water; the mixture was filtered and the solution collected was evaporated to dryness. It was observed that some material remained in the evaporating dish.
What, in your opinion, is the nature of this material?
9. Describe, with the aid of labelled diagrams, the life cycle of a named insect.
List the external features which enable you to classify an organism (i) as an arthropod, (ii) as an insect.
State two ways in which the activities of insects are useful to man and two ways in which they are harmful.
10. Describe what happens to starch from the time it enters the mouth until it is finally converted to glucose.
State briefly the route taken by glucose from the time it enters the blood stream until it reaches a muscle cell in the arm.
11. (a) Draw a labelled diagram of the reproductive system of the female mammal. Indicate clearly on the diagram the region where sperms are liberated by the male.
What is the essential feature of all sexual methods of reproduction?
- (b) Draw labelled diagrams to show the structure of a dicotyledonous seed.
12. (i) Describe with the aid of labelled diagrams the process of mitosis in a cell.
- (ii) A pea plant with the genotype *RRTT* was crossed with a plant of genotype *rrtt*. Show the genotypes of the gametes and of the progeny of the cross.
13. Write brief notes on four of the following: (i) endocrine glands, (ii) corm, (iii) food vacuole and contractile vacuole, (iv) translocation, (v) white blood cells.
14. Explain how transpiration occurs, with the aid of a labelled diagram of a section through a leaf.
Under what environmental conditions will transpiration be greatest?
State two ways by which plants living in very dry situations are modified to reduce transpiration.
15. (a) Describe how you would prepare and stain a blood smear to examine microscopically the structure of blood. State the precautions you would take to ensure that the smear was well stained and describe how you would use the microscope to examine the smear.
- (b) Describe an experiment to test the hypothesis that carbon dioxide is necessary for photosynthesis.