

Write your Examination Number here

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AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1971

BIOLOGY—HIGHER LEVEL

MONDAY, 21st JUNE—AFTERNOON, 2 to 4.30

Answer all the questions in Part I and any four questions in Part II.

You should not spend more than 40 minutes on Part I, leaving about 100 minutes for Part II.

PART I (120 marks)

Answer all the questions (1 – 7). Write your answers in the spaces provided below.

Keep your answers short. Write your examination number at top.

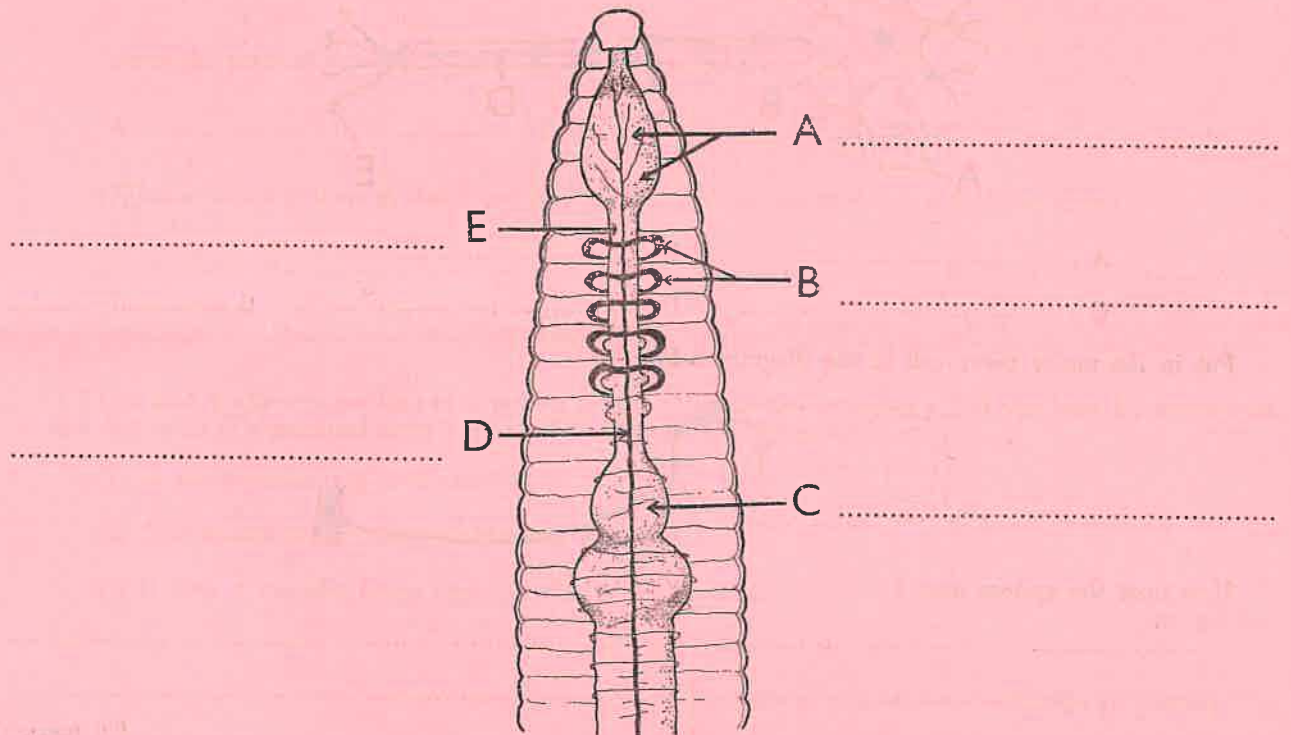
Be sure to return the examination paper: enclose it in the answer-book you use for answering Part II.

1. Complete the following statements by adding the appropriate word, or two words, in each case.

- (i) In digestion the end-product of starch breakdown is
- (ii) *Amoeba* gets rid of excess water through the
- (iii) Deoxygenated blood is carried from the heart to the lungs in the
- (iv) The causative organism in potato blight is
- (v) The principal photosynthetic pigment is

(15 marks)

2. Name the parts marked A, B, C, D, E, in the diagram of the dissection of the earthworm shown below.



(15 marks)

3. List the constituents of a balanced human diet.

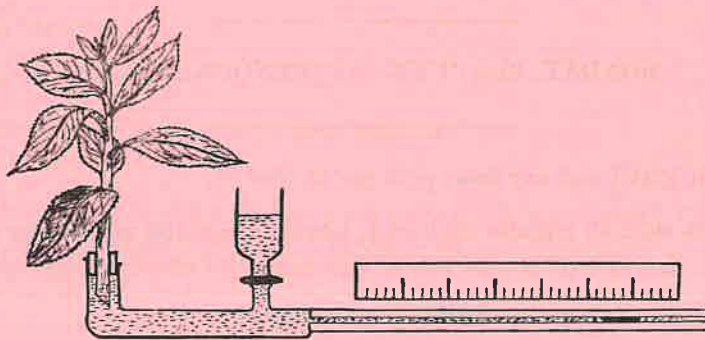
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Complete the following table for the vitamins A, C and D:

Vitamin	Main Sources of Vitamin	Effect of Deficiency
A		
C		
D		

(15 marks)

4.



Name this apparatus.....

What is the apparatus used to measure?

State a precaution you would take when cutting the shoot for use in the apparatus and your reason for this precaution.

(i) Precaution:

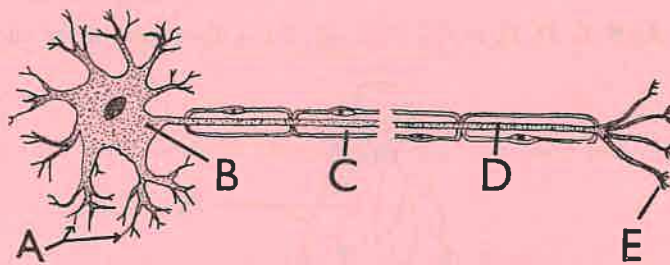
(ii) Reason for it:

(15 marks)

5. What does 'motor nerve cell' mean?

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Name the parts labelled in the diagram of the motor nerve cell below:



A B

C D E.....

Put in the motor nerve cell in the diagram below

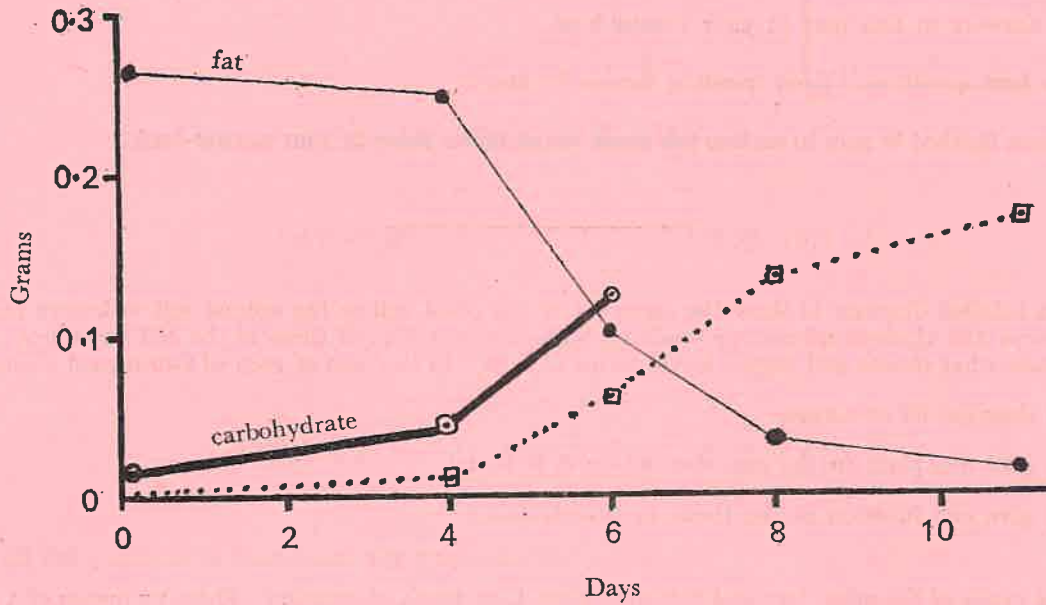


How does the system work?

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(20 marks)

6. The graph below shows the changes in fat and carbohydrate content of the endosperm of a seed during germination. (From an experiment carried out by Desveaux and Kogane-Charles, 1952).



From the graph suggest what occurs in regard to endosperm fat and carbohydrate during the first six days.

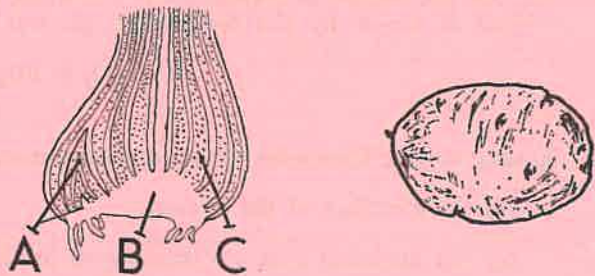
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The seed embryo obtains its carbohydrate for growth from the endosperm. The dotted line in the graph shows how the embryo carbohydrate content changes. Show the change you would expect in the endosperm carbohydrate during days 6–10 by extending the graph of the endosperm carbohydrate.

(20 marks)

7. The diagrams show a bulb in vertical section and a potato tuber.



Name the parts of the bulb labelled A, B, C.

A.....B.....C.....

What evidence is there in the diagram of the tuber to suggest that it is a modified stem?

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If you took transverse sections of a potato tuber, which of the following would you look for to confirm that the tuber is a modified stem? (Underline the one you select.)

- (a) A single centrally placed vascular bundle.
- (b) The section turning blue on staining with iodine.
- (c) A ring of vascular tissue near the edge of the section.

(20 marks)

PART II (280 marks)

Write your answers to this part in your answer-book.

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

When you have finished be sure to enclose the whole examination paper in your answer-book.

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8. Draw a labelled diagram to show the structure of the plant cell or the animal cell as known from light microscope and electron microscope studies. State the functions of three of the cell structures. Explain what tissues and organs are in terms of cells. In the case of each of two named tissues
- describe its structure,
 - give one place in the organism where it is found,
 - give one function of the tissue in that location.
9. The life cycles of the moss, fern and flowering plant have much in common. Show by means of a diagram the major features that those life cycles have in common. What evidence do you see in the life cycles that would suggest to you that evolution has taken place? State the direction of this evolution.
10. State clearly, referring to your own observations, what is meant by succession in ecology and what the end result of this process is. State the part played by competition in succession. What stage in succession is most of man's agriculture based on? Give a reason for your answer.
11. (i) Draw a diagram of the urino-genital system of the male mammal. Label the parts and list their main functions.
(ii) Outline the principle stages of meiosis.
12. Describe the process of respiration in the living cell. State clearly its importance to living organisms. What is meant by the respiratory quotient? Calculate the respiratory quotient for the reaction
- $$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O.$$
13. Summarize your knowledge of the vascular system of the dicotyledonous flowering plant under the headings
- the structure of the system,
 - the materials that are transported in the system,
 - how the system operates.
- Outline the major differences between the plant system you have just described and the mammalian vascular system.
14. Give a short account of the structure and reproduction of a fungus. Briefly outline the importance of bacteria to man. Describe, giving the reasons for them, the main practical procedures involved in the handling of fungi and bacteria in the laboratory.
15. The concentration of DNA per cell nucleus was found to be approximately the same in the kidney, heart, and pancreas of an animal. Using your knowledge of DNA and mitosis suggest why the DNA concentration is approximately the same in these different cell types. Referring to DNA explain why a gardener uses vegetative propagation instead of seed to propagate a plant of a particular genotype.
16. List the major processes in the growth of a plant that are controlled by auxins. As an example of how auxins work, describe the action of auxins in causing the bending of plants in response to light. Outline an experiment you could use in support of your answer. How does the action of auxins satisfy the definition of a hormone?