

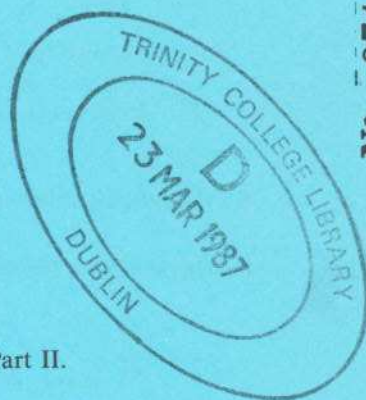
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AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1986  
BIOLOGY—ORDINARY LEVEL

TUESDAY, 17 JUNE—MORNING, 9.30 to 12.30



No 37151

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) Organic chemicals produced in ductless glands and transported in the blood stream to target organs where they have their effect are known as.....
- (b) Name the organ mainly responsible for the production of urea. ....
- (c) In what form is the genetic information stored in a cell? .....
- (d) Name the part of the eye that detects light. ....
- (e) Name the phylum to which insects belong. ....

2. In an experiment on photosynthesis a plant with variegated leaves was left for a period in bright light. The leaves were then tested for the presence of starch. The result is shown below.

Test for Starch	
white area of leaf	brown
green area of leaf	blue-black

- (i) What hypothesis was being tested in this experiment?  
.....
- (ii) The plant was kept in total darkness for a period before being exposed to the light. Suggest a reason for this.  
.....
- (iii) After the period of exposure to light, leaves from the plant were dipped in boiling water for a short time. Why?  
.....
- (iv) The leaves were then placed in warm alcohol. Why?  
.....
- (v) What substance was finally put on the leaves to give the result shown in the table? .....

3. State precisely where each of the following is located.

- (i) Synapse .....
- (ii) Hepatic portal vein .....
- (iii) Tendon .....
- (iv) Cardiac muscle .....
- (v) Cerebrum .....

4. Answer the following by placing a tick (✓) in the appropriate box in each case.

(a) The correct sequence of bones in the middle ear, starting from the eardrum, is:

- A anvil stirrup hammer
- B anvil hammer stirrup
- C hammer anvil stirrup
- D hammer stirrup anvil

(b) Which one of the following sets of enzymes is produced in the pancreas?

- A amylase pepsin lipase
- B lipase lactase maltase
- C lipase amylase trypsin
- D maltase amylase trypsin

(c) Which one of the following sets of diseases is caused by bacteria?

- A boils tonsilitis colds
- B boils food-poisoning tuberculosis (TB)
- C measles boils flu
- D smallpox rabies mumps

(d) Which one of the following sets of joints is a set of hinge joints?

- A shoulder hip neck
- B shoulder elbow wrist
- C hip finger toe
- D elbow knee finger

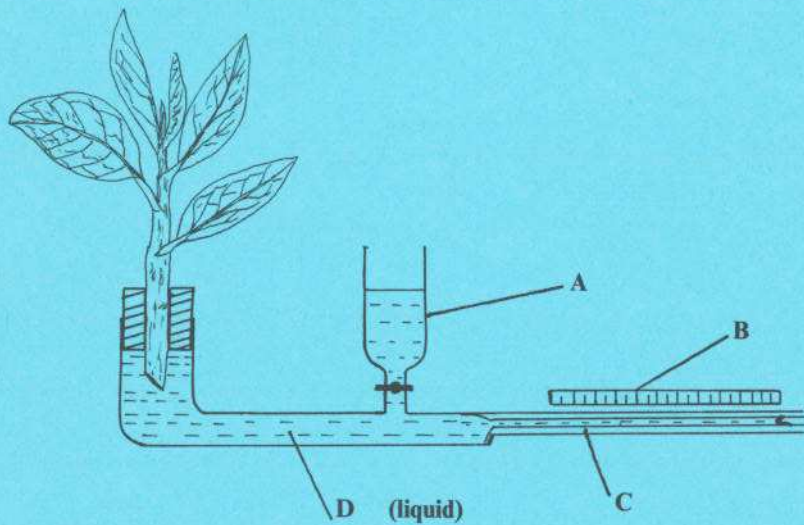
(e) Which one of the following sets of conditions is necessary for the germination of all seeds?

- A heat chlorophyll oxygen
- B heat water oxygen
- C light water carbon dioxide
- D water carbon dioxide heat

5. Indicate whether each of the following statements is true or false by putting a circle around the appropriate letter, T or F.

	True	False
Example: <i>Amoeba</i> is a protozoan.	(T)	F
(a) Annual rings in wood contain xylem and sclerenchyma.	T	F
(b) Insulin controls the level of sugar in the blood.	T	F
(c) Conifers are wind-pollinated trees.	T	F
(d) Semen contains both sperm and fluid.	T	F
(e) Osmosis requires a semi-permeable membrane.	T	F
(f) Meristems are sites of active cell division in a growing plant.	T	F
(g) Butterflies undergo incomplete metamorphosis.	T	F
(h) The bark of a tree consists of everything outside the vascular cambium.	T	F
(i) The pacemaker is found in the left atrium (auricle) of the heart.	T	F
(j) Animal cells contain plastids.	T	F

6. Name the apparatus shown in the diagram .....



Name the parts labelled.

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

What plant process would you measure using this apparatus?.....

Name two environmental factors which could affect the rate of this process.

1. .... 2. ....

7. State the purpose for which you would use any *five* of the following in biological experiments.

Fehlings' (or Benedict's) solution: .....

Universal indicator: .....

Clinostat: .....

Chromatography: .....

Cobalt chloride: .....

Tullgren (or Baermann) funnel: .....

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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)

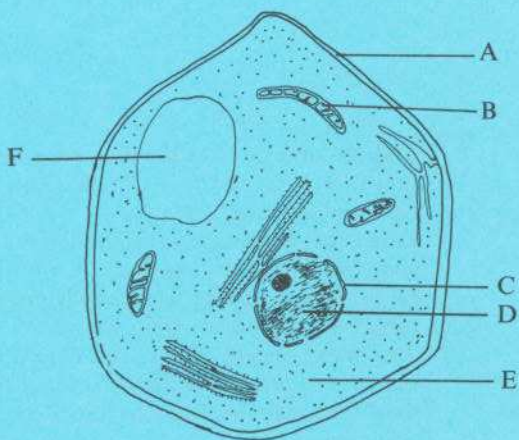
Write your answers to this part in your answer-book.

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

8. (a) Name and give a function for each of the parts A, B, C, D, E, F, on the diagram of a plant cell.

Draw and fully label a diploid cell with four chromosomes as seen in anaphase I of meiosis.

State the difference in chromosome number between the products of mitosis and the products of meiosis. (38)

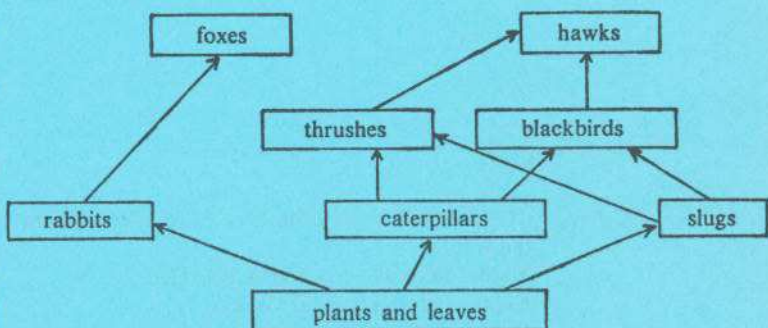


- (b) Explain the term genetics and give *two* examples of the importance of the science of genetics today.

In humans the character brown-eyed (**B**) is dominant to blue-eyed (**b**). Given that both parents are heterozygous for the character, show (i) the genotypes of the gametes, (ii) the possible genotypes and phenotypes of their children. What are the chances of there being a blue-eyed child? (32)

9. The diagram represents part of a food web of a woodland.

From the food web give (i) a primary producer, (ii) a primary consumer, (iii) all the secondary consumers, (iv) a simple food chain, (v) a pyramid of numbers. (32)



Imagine that most of the hawks were killed. Suggest what effect this would have on the numbers of (i) blackbirds, (ii) foxes, (iii) plants and leaves, in the short term. (18)

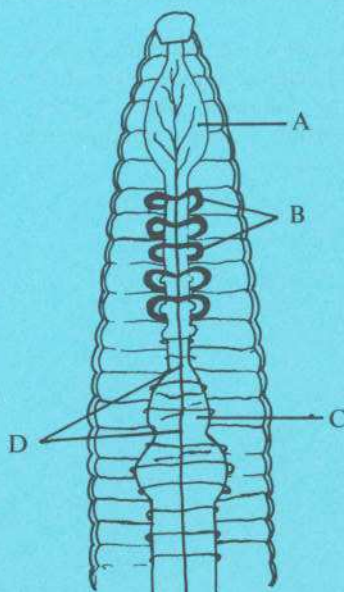
Outline one method (other than direct count) you used to estimate the number of animals *and* one method you used to estimate the number of plants in the habitat you studied. (20)

10. Name the parts labelled A, B, C, D, on the diagram of a dissected earthworm.

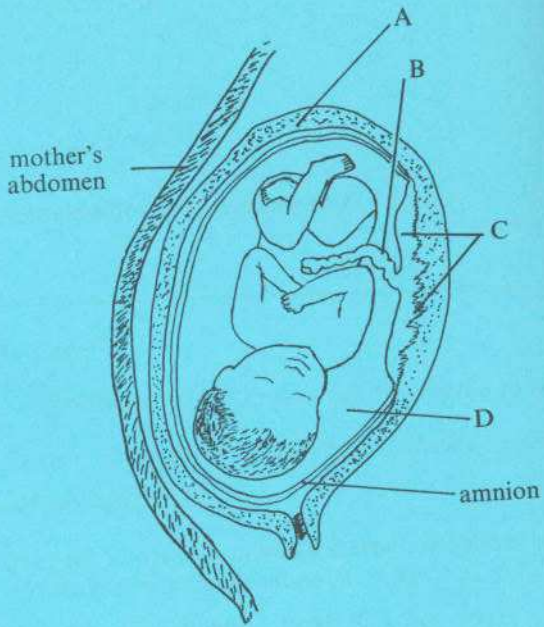
Give one function for each of the parts A and B.

Explain how the following: circular muscles, longitudinal muscles, chaetae, participate to bring about movement in the earthworm. (40)

Outline with the aid of a diagram how you would set up a wormery to demonstrate any one named example of earthworm behaviour. (30)

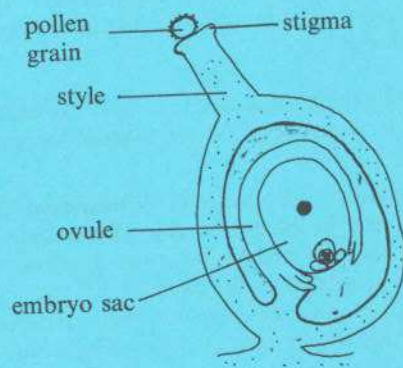


11. List six components of a fertile soil. Compare a sandy soil and a clay soil under the headings (i) particle size, (ii) air spaces, (iii) fertility, (iv) workability. (28)  
 Describe an experiment by which you could measure the humus content of a sample of soil that has already been dried. (20)  
 Give a labelled outline diagram of a transverse section (through the root-hair zone) of a young dicotyledonous root. State the function of root hairs. (22)

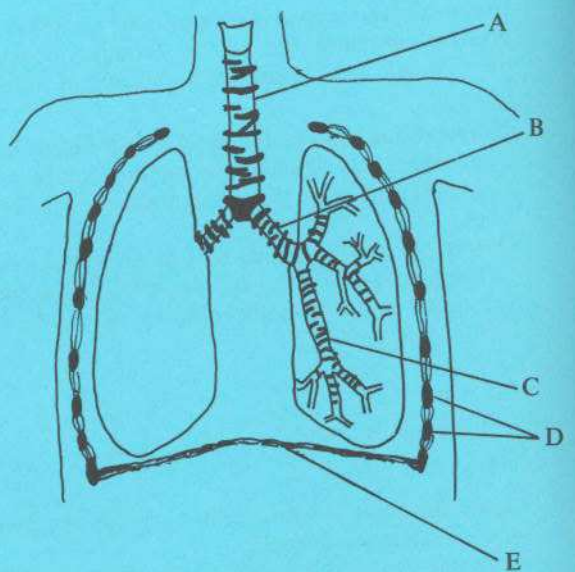


12. (a) The diagram shows a foetus in the uterus a short time before birth. Name the parts labelled A, B, C, D. State two functions of C. What happened to the uterus lining that prepared it for the pregnancy? What is the duration of a normal pregnancy in humans? How is a foetus protected from injury that might arise as a result of sudden movements of its mother's body? (38)

- (b) Make a large copy of the diagram of the carpel of a flower in your answerbook. (You need not copy the labels given.) Label the following on your diagram: ovary, endosperm nucleus, egg nucleus. Draw in on your diagram the fully grown pollen tube from the pollen grain shown. Two male gamete nuclei are released from the pollen tube. Say where this occurs and state what must then take place so that fertilisation may be fully completed. (32)

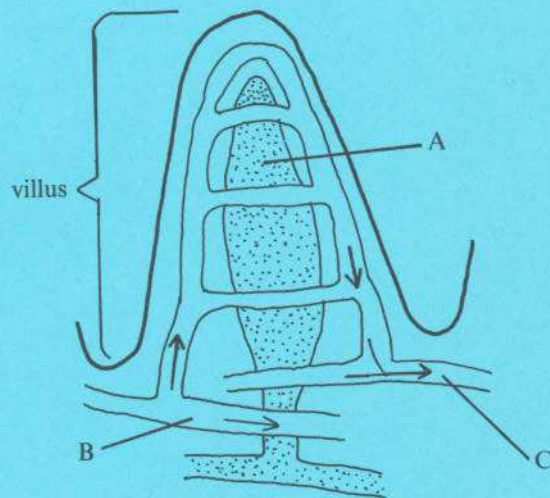


13. (a) The diagram shows the breathing apparatus in the human. Name the parts labelled A, B, C, D, E. Explain the term tidal volume. How would you show that exhaled air contains more carbon dioxide than inhaled air. (44)
- (b) Draw a large diagram to show the human (male or female) urinary excretory system, and label the following parts: kidney, ureter, bladder, urethra. Name three substances found in normal urine. (26)



14. (a) Describe the life cycle of the potato blight fungus, *Phytophthora infestans*. (34)
- (b) Describe an experiment to show the presence of bacteria on your finger. You should include in your answer a diagram of the apparatus, the method of carrying out the experiment (including a suitable control), the safety precautions you would take and the observations you would expect to make. (36)
15. Answer *two* of the following. (35, 35)
- (a) Name three parts of the human skeleton that have a major protective function and, in each case, state what is protected. State the part played by the skeleton in the formation of blood. In an experiment a bone, after being placed for some time in hydrochloric acid solution, was found to be flexible and rubbery. Suggest an explanation for this.
- (b) Draw a labelled diagram of a vertical section through a leaf. Give two features common to leaves and lungs that facilitate gas exchange.

- (c) The diagram illustrates a villus from the intestine. Name the parts A, B, C and state the main function of each part. What would you expect to find in A that you would not expect to find in B or C? What would you expect to find a lot of in C but very little of in B? The structure A belongs to a special body system. What is that system? State two other functions of the system.



- (d) Explain (i) perennation, (ii) vegetative propagation. Outline with the aid of diagrams *two* methods of vegetative propagation.