

Write your Examination Number here 



Coimisiún na Scrúduithe Stáit State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2005

BIOLOGY - ORDINARY LEVEL

TUESDAY, 14 JUNE - AFTERNOON, 2.00 to 5.00

Section A. Answer any **five** questions from this section.
Each question carries 20 marks.
Write your answers in the spaces provided on **this examination paper**.

Section B Answer any **two** questions from this section.
Each question carries 30 marks.
Write your answers in the spaces provided on **this examination paper**.

Section C Answer any **four** questions from this section.
Each question carries 60 marks.
Write your answers in the **answer book**.

It is recommended that you should spend not more than 30 minutes on Section A and 30 minutes on Section B, leaving 120 minutes for Section C.

You must return this examination paper with your answer book at the end of the examination.

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Section A

Answer any five questions.
Write your answers in the spaces provided.

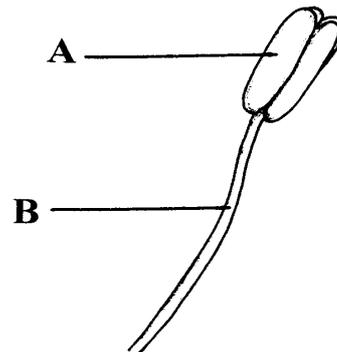
1. Explain **four** of the following terms that are used in ecology.

- (a) Biosphere
-
- (b) Habitat
-
- (c) Consumer
-
- (d) Producer
-
- (e) Niche
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2. Use ticks (✓) to show if the named structure is present in an animal cell, in a plant cell or in both.
The first has been completed as an example.

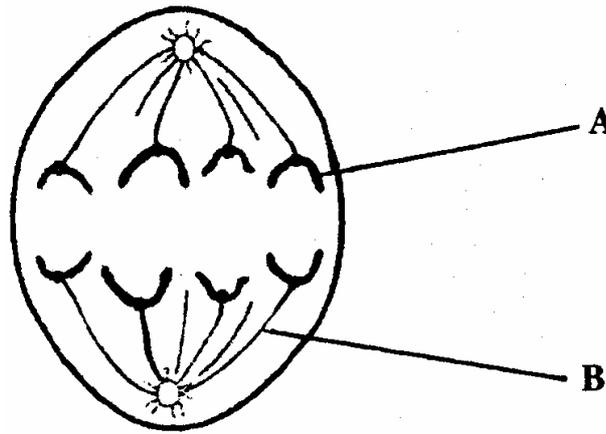
Structure	Cytoplasm	Cell Wall	Chloroplast	Nucleus	Vacuole
Animal Cell	✓				
Plant Cell	✓				

3. The diagram shows the external structure of a stamen.



- (a) Name A and B
 A
- B
- (b) Where is pollen produced, in A or in B?
- (c) To which part of a flower is pollen carried?
- (d) What is meant by cross-pollination?
-
- (e) Name two methods of cross-pollination.
 1.
 2.

4. The diagram shows a stage of mitosis.



(a) Name A and B

A B

(b) What is happening during this stage of mitosis?

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(c) How many cells are formed when a cell divides by mitosis?

(d) For what purpose do single-celled organisms use mitosis?

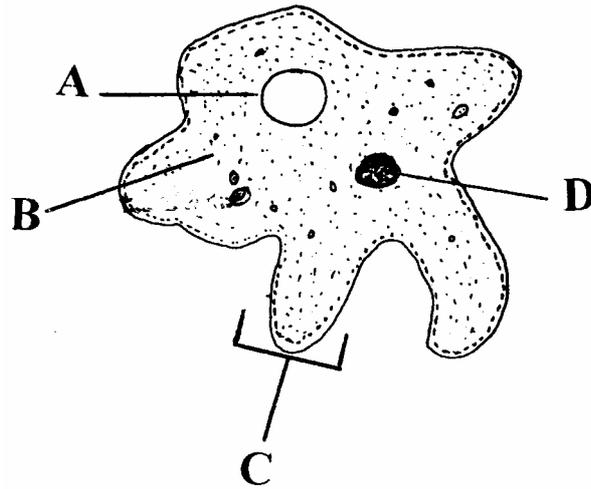
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5. The table below includes some common elements found in food. Complete the table by putting a tick (✓) in the box if an element is present and a cross (X) if an element is absent. Two boxes have been completed as examples.

	Carbohydrate	Protein	Fat
Oxygen	✓		
Nitrogen	X		
Hydrogen			
Carbon			

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6. (a) The diagram shows the structure of *Amoeba*.



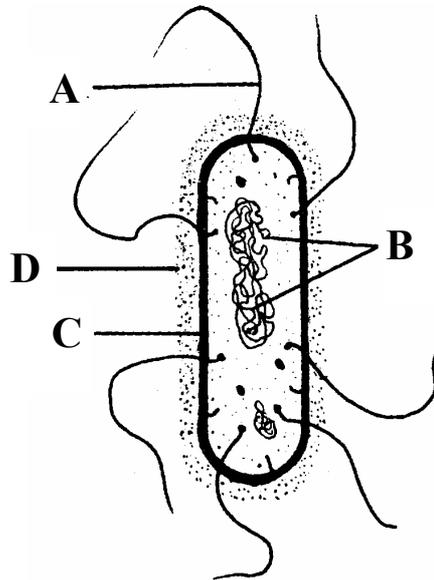
(i) Name A, B, C, D.

A B

C D

(ii) To which kingdom does *Amoeba* belong?

(b) The diagram shows the structure of a typical bacterium.



(i) Name A, B, C, D.

A B

C D

(ii) To which kingdom do bacteria belong?

Section B

Answer any two questions.

Write your answers in the spaces provided.

Part (a) carries 6 marks and part (b) carries 24 marks in each question in this section.

7. (a) (i) What is osmosis?
-
- (ii) What is a selectively permeable (semi-permeable) membrane?
-
- (b) (i) Draw a labelled diagram of the apparatus that you used to demonstrate osmosis.

- (ii) Describe how you carried out the experiment to demonstrate osmosis.
-
-
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-
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-
-
- (iii) How were you able to tell that osmosis had taken place?
-
-
-

8. (a) (i) What is an enzyme?
-
- (ii) Comment on the shape of enzyme molecules.
-

(b) Answer the following questions in relation to an experiment that you carried out to investigate the effect of temperature on enzyme activity.

- (i) What enzyme did you use?
- (ii) What substrate did you use?
- (iii) Draw a labelled diagram of the apparatus that you used.

(iv) How did you know that the enzyme had completed its activity?

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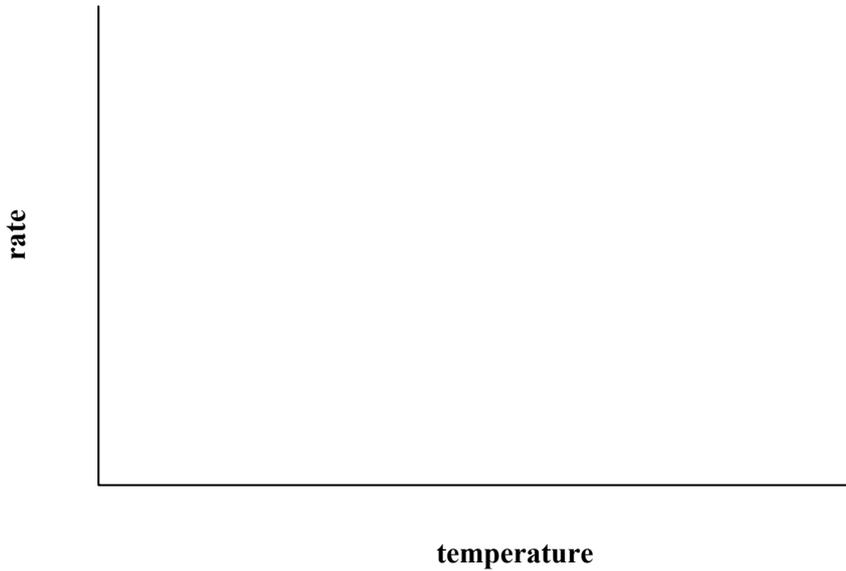
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(v) How did you vary the temperature in your experiment?

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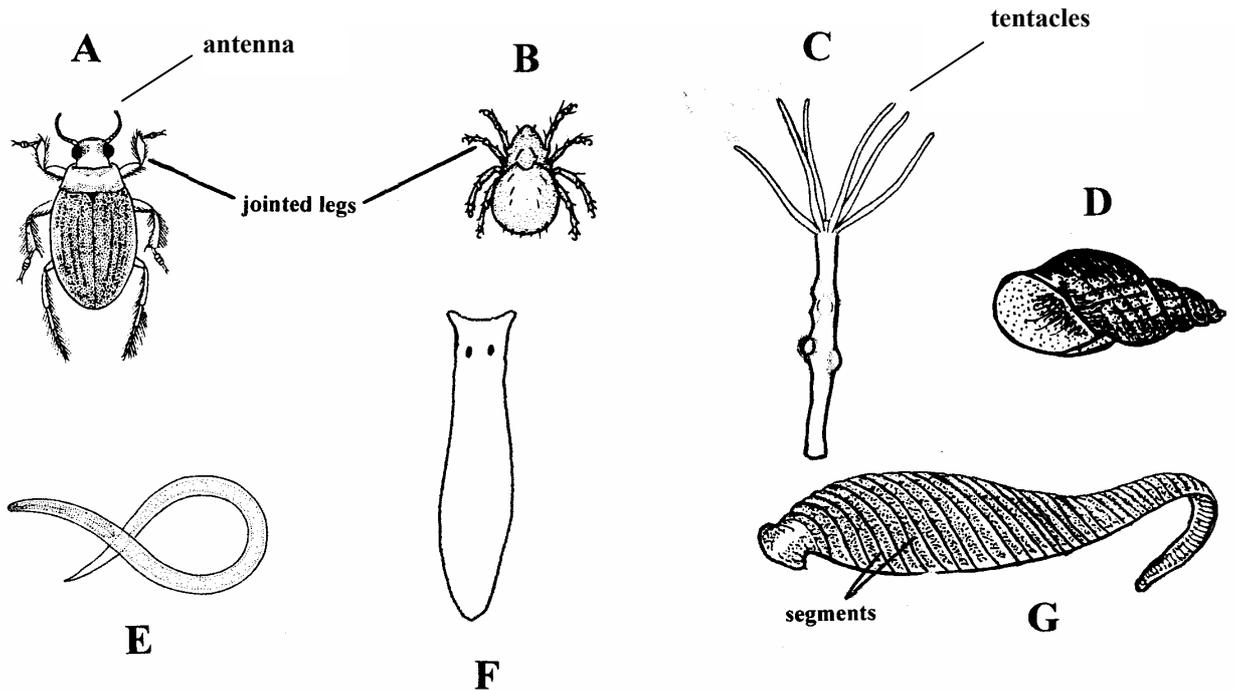
(vi) Draw an outline graph of the results that you obtained.



Section C

Answer any four questions.
Write your answers in the answer book.

10. (a) (i) What is an ecosystem? (9)
(ii) Name **two** ecosystems found in Ireland.
- (b) Animals A, B, C, D, E, F, G were found in a small lake. They are not drawn to the same scale. Use the following key to identify each of these animals. Write down each letter and the animal it represents in your answer book. (21)

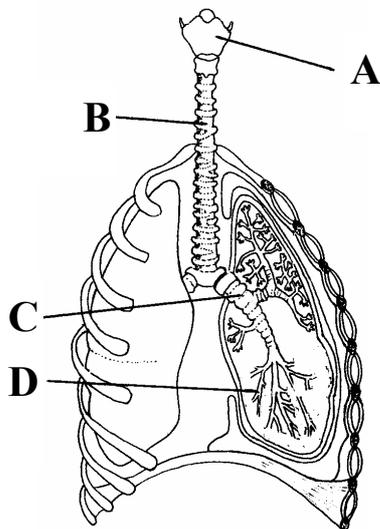


- | | | |
|----|---|---------------|
| 1. | Jointed legs present | 2 |
| | Jointed legs absent | 3 |
| 2. | Three pairs of jointed legs..... | Diving beetle |
| | Four pairs of jointed legs..... | Water mite |
| 3. | Body divided into segments..... | Leech |
| | Body not divided into segments..... | 4 |
| 4. | Shell present | Pond snail |
| | Shell absent | 5 |
| 5. | Ring of tentacles around the mouth..... | <i>Hydra</i> |
| | No tentacles..... | 6 |
| 6. | Flat body with eye spots..... | Planarian |
| | Round body with pointed ends | Nematode |

- (c) (i) What is meant by pollution?
(ii) Describe a human activity that may result in pollution. Suggest a way in which this pollution could be prevented.
(iii) What do you understand by the term conservation?
(iv) Suggest **three** reasons for conserving wild animals and plants. (30)

11. (a) (i) Complete the following equation, which is a summary of photosynthesis.
 $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light} + \text{chlorophyll} \longrightarrow$
- (ii) Where in the cells of a leaf is chlorophyll found? (9)
- (b) (i) Light energy trapped by chlorophyll is used to split water. List **three** products that result when water is split.
- (ii) Describe what happens to each of the **three** products that you have listed in (i).
- (iii) Carbon dioxide is essential for photosynthesis. Where does it enter the leaf?
- (iv) From your knowledge of photosynthesis suggest a way to increase the yield of plants such as lettuces in a greenhouse. (24)
- (c) (i) Some of the carbohydrates produced in photosynthesis are used in respiration. What is respiration?
- (ii) Suggest **one** reason why living organisms need to respire.
- (iii) What is aerobic respiration?
- (iv) Respiration can also be anaerobic. Which of the two types of respiration releases more energy?
- (v) Anaerobic respiration by micro-organisms is called fermentation. Give **one** example of industrial fermentation, including the type of micro-organism and the substance produced. (27)

12. (a) (i) Name the major blood vessels that carry blood
1. from the heart to the lungs
 2. from the lungs to the heart.
- (ii) What gas is released from the blood when it reaches the lungs? (9)
- (b) The diagram shows part of the human breathing system.

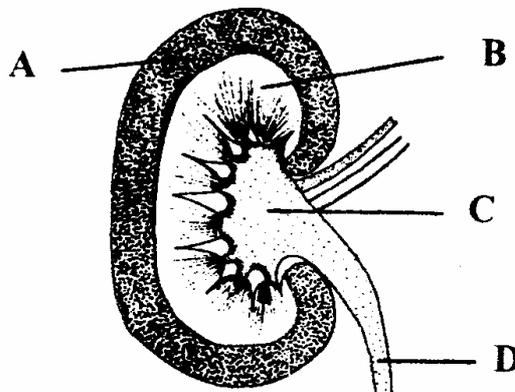


- (i) Name A, B, C, D.
- (ii) D ends in a small sac. What is the name of this sac?
- (iii) What is the function of A?
- (iv) B contains rings of cartilage. Suggest a function of this cartilage.
- (v) Where is the epiglottis? What is its function? (27)
- (c) (i) Name the muscles that are used in breathing.
- (ii) Breathing causes pressure changes in the thoracic cavity. Describe briefly how these pressure changes are brought about.
- (iii) Name a breathing disorder. Give a possible cause of this disorder and suggest a means of prevention **or** treatment. (24)

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13. (a) For each of the following parents give the genotypes of all the possible gametes that it can produce.
- (i) Parent Aa. (9)
- (ii) Parent AaBb. (9)
- (b) (i) Name the four bases that are found in DNA.
- (ii) These bases form a triplet code. What is meant by a triplet code?
- (iii) The triplet code is transcribed into mRNA. What does this statement mean?
- (iv) To which structures in the cell does mRNA carry the code? (24)
- (c) (i) What is evolution?
- (ii) What is Natural Selection?
- (iii) Name **one** of the scientists who developed the Theory of Natural Selection.
- (iv) Give a brief account of the evidence for evolution from **one** named source. (27)
14. Answer **any two** of (a), (b), (c). (30, 30)

- (a) The diagram shows a section through a human kidney.

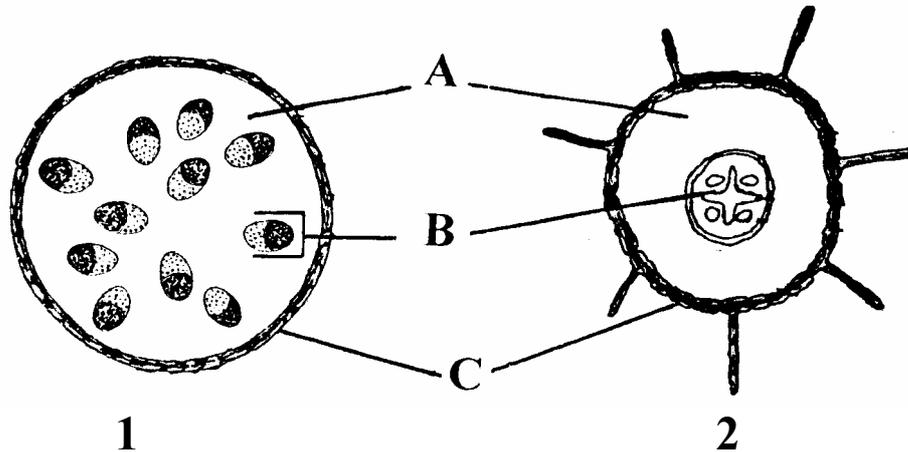


- (i) Name A, B, C, D.
- (ii) To what structure does D connect the kidney?
- (iii) Filtration is an essential process in the formation of urine. In what part of the kidney does it take place?
- (iv) Reabsorption of useful substances takes place in the kidney. In what part does this occur?
- (v) Name an excretory substance present in urine.
- (vi) Name an excretory organ in the human body other than the kidney. Name a substance, other than the one you have named in (v), excreted by this organ.
- (b) (i) Draw a large labelled diagram of the reproductive system of the human female.
- (ii) Indicate on your diagram where each of the following events takes place; fertilisation, implantation.
- (iii) What is the menstrual cycle? Outline the main events of the menstrual cycle.
- (c) Answer the following questions in relation to blood vessels in the human body.
- (i) Valves are present in veins. What is their function?
- (ii) Why are valves not needed in arteries?
- (iii) Which has the bigger lumen (cavity), an artery or a vein?
- (iv) The wall of capillaries is only one cell thick. How is this related to their function?
- (v) How does a portal vein differ from other veins?
- (vi) Name the following blood vessels;
1. the vessels that carry blood from the aorta to the kidneys.
 2. the vessels that supply the heart's muscle with blood.

15. Answer any two of (a), (b), (c).

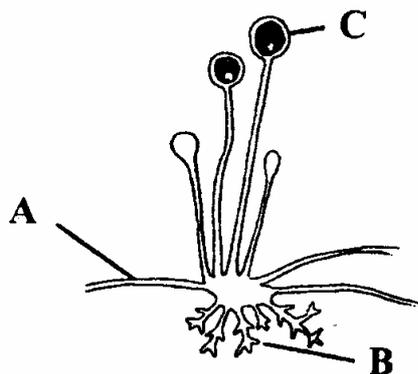
(30, 30)

- (a) (i) Which of the two diagrams 1 or 2 represents a transverse section of a young root?
(ii) State **two** features of the diagram that indicate it is a root.
(iii) The letters A, B, C in the diagram represent three different tissue types. State which tissue type in the following list is represented by each letter;
ground tissue, vascular tissue, dermal tissue.
(iv) Name **two** vascular tissues and give **one** way in which they differ.
(v) State a function of ground tissue.



- (b) (i) What is vegetative propagation?
(ii) Give **one** example of vegetative propagation and state whether it involves a stem, a root, a leaf or a bud.
(iii) How does vegetative propagation differ from reproduction by seed?
(iv) Artificial propagation is widely used in horticulture. Give **two** examples of artificial propagation.
(v) Suggest **one** advantage and **one** disadvantage of artificial propagation.

(c) The diagram shows part of the mycelium of *Rhizopus*.



- (i) Identify A, B, C.
(ii) State a function of B.
(iii) State a function of C.
(iv) What term is used to describe the nutrition of *Rhizopus*? Explain the importance of this type of nutrition in nature.
(v) To what kingdom does *Rhizopus* belong?
(vi) Name another organism that you have studied in your biology course that belongs to the same kingdom as *Rhizopus*.

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