

WARNING

This Question Paper **MUST** be returned with your answer book(s) at the end of the Examination:
otherwise marks will be lost.

M. 43

Write your Examination Number here 



Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION 2003

BIOLOGY - ORDINARY LEVEL

WEDNESDAY, JUNE 11 - AFTERNOON, 2.00 to 5.00

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)

Questions 1 - 7

Answer **six** questions. Each question carries 20 marks.
Write your answers in the spaces provided.
Keep your answers short.

PART II (280 marks)

Questions 8 – 15

Write your answers to this part in your answer book.
Answer **four** questions.
Each question carries 70 marks.

PART I (120 marks)

Answer **six** questions. Each question carries 20 marks.
Write your answers in the spaces provided.
Keep your answers short.

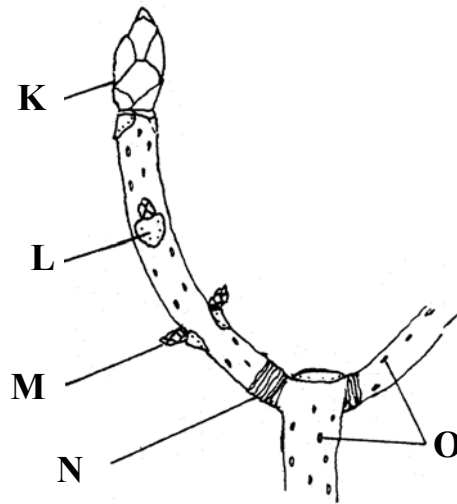
1. Answer **four** of the following.

- (a) The eustachian tube (canal) joins the pharynx to the
- (b) The renal artery brings blood to the
- (c) The setae (chaetae) of the earthworm are used for
- (d) The cuticle of a leaf reduces the loss of
- (e) Rickets results from a lack of vitamin

2. The diagram shows part of a woody twig.

(a) Name the parts labelled K, L, M, N, O.

- K
- L
- M
- N
- O



- (b) What is the function of O?
- (c) How many years' growth is shown in the diagram?
- (d) How does N form?
- (e) What term is used to describe trees with twigs like the one in the diagram?

3. For what purpose might a biologist use each of the following?

- (a) Pooter
- (b) Potometer
- (c) Lime water
- (d) Cobalt chloride paper

(e) Wax-lined dish

4. The diagram shows the structure of a knee.

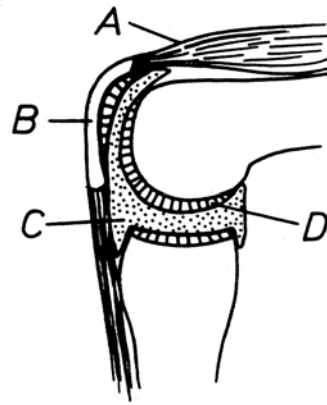
(a) Name the parts labelled A, B, C, D.

A

B

C

D



(b) State the function of D.

(c) What type of joint is the knee joint?

(d) Name **two** other types of joint.

5. Where would you find each of the following in the human body?

(a) Pituitary gland

(b) Cones

(c) Corpus luteum

(d) Gall bladder

(e) Villi

(f) Islets of Langerhans

(g) Cochlea

6. Study the diagram of the apparatus and then answer the following questions.

(a) What is the experiment designed to investigate?

.....
.....

(b) What is the function of the soda-lime?

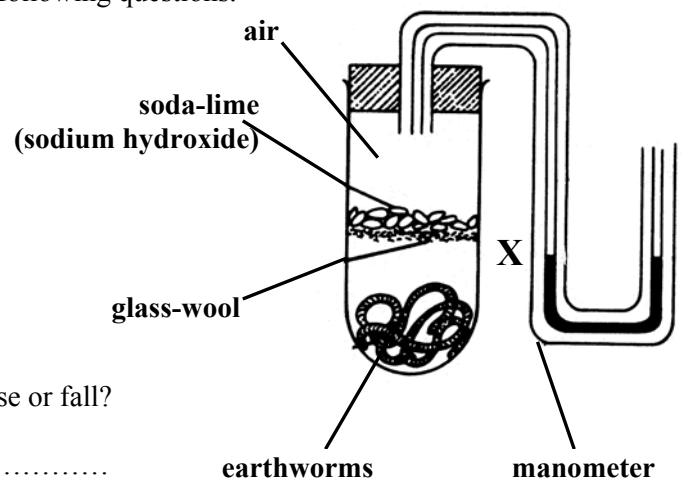
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(c) After a period of time will the fluid level at X rise or fall?

.....

(d) Explain your answer to (c).

.....



- (e) What do you think would happen to the fluid level at X if the experiment was carried out without soda lime?

.....

7. (a) In the space below draw a diagram of a plant cell as seen under the light microscope.

Place labels on four parts of the cell, including at least one organelle.

- (b) State the function of an organelle that you have drawn.

Name of organelle

Function

- (c) Name a stain that you might use when examining a plant cell under the microscope.

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PART II (280 marks)

Write your answers to this part in your answer book.

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

8. (a) Explain the following terms that are used in genetics:

gene, locus, homozygous, genotype. (24)

(b) In pea plants, the allele for purple flower (**P**) is dominant to the allele for white flower (**p**). Copy the following into your answer book and complete the spaces to show the following crosses. Make sure that you distinguish between upper case **P** and lowercase **p** in your answer.

Cross 1. A plant that was homozygous for purple flowers was crossed with a plant with white flowers and all the progeny were found to have purple flowers.

Phenotypes of parents	_____	X	_____	
Genotypes of parents	()		()	
Genotypes of gametes	()		()	
Genotype of progeny	()			
Phenotype of progeny	_____			

Cross 2. The progeny of cross 1 were then crossed with white-flowered plants.

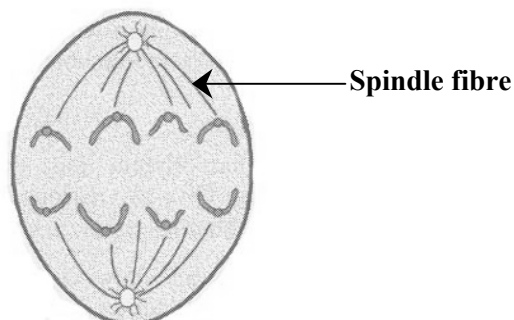
Phenotypes of parents	_____	X	_____	
Genotypes of parents	()		()	
Genotypes of gametes	() ()		()	
Genotypes of progeny	() ()			
Phenotypes of progeny	_____			

(26)

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

- (i) Describe what is happening at this stage of mitosis and what happens during the phase that follows immediately.
- (ii) State **two** differences between the products of mitosis and meiosis.
- (iii) State **one** place in a flowering plant where mitosis occurs.

(20)

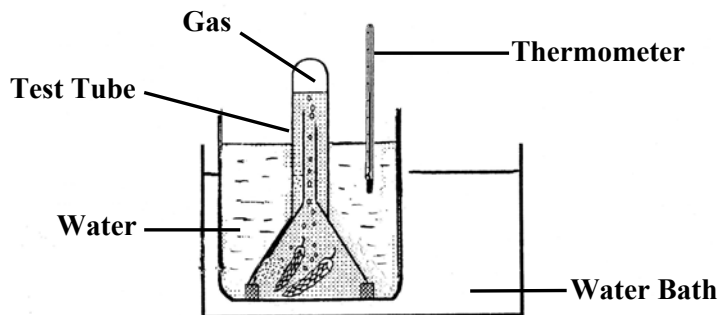


9. (a) Use a labelled diagram to illustrate the structure of a typical bacterial cell. Name **one** structure of the bacterial cell which is not found in human cells. (18)
- (b) List **four** methods that are commonly used for preserving food. In each case explain briefly how the bacteria that cause decay are affected. (24)
- (c) Describe how you would show that bacteria are present in water OR soil. (28)
10. (a) *Amoeba*, earthworm, spider, rabbit.
- For each of these animals state:
- (i) The phylum to which it belongs.
- (ii) **One** reason why it is placed in its phylum. (24)
- (b) (i) Where would you expect to find *Amoeba*?
- (ii) *Amoeba* is described as a consumer. What does this mean?
- (iii) Name **one** waste product in *Amoeba* and describe how it gets rid of it. (16)
- (c) (i) Name **two** structures present in *Amoeba* which are not present in *Spirogyra*.
- (ii) Name **two** structures present in *Spirogyra* which are not present in *Amoeba*.
- (iii) *Amoeba* and *Spirogyra* both use asexual reproduction. Briefly describe this process in each of them. (30)
11. (a) (i) Draw a large labelled diagram of a vertical section through the mammalian heart. Include the attached parts of the major blood vessels in your diagram and label the following: bicuspid valve, left ventricle, right atrium, septum, aorta, pulmonary artery.
- (ii) Why is there more muscle in the wall of the left ventricle than in the wall of the right ventricle? (31)
- (b) Answer the following sections in relation to red blood cells.
- (i) Give **one** location in which they are made.
- (ii) Describe their shape.
- (iii) Name a metal associated with them.
- (iv) State **one** function.
- (v) State **one** difference (other than colour) between a red blood cell and a white blood cell. (15)
- (c) Describe an experiment to investigate the effect of activity on the human heart rate. (24)

12. (a) (i) Draw and label the apparatus that you would use to show that carbon dioxide is essential for photosynthesis. (24)
 (ii) Name a suitable plant to use in this experiment.
 (iii) How would you destarch the plant in the experiment? (22)
- (b) Describe the procedures that you would follow to test a leaf for starch. (22)

(c) Answer the following questions in relation to the apparatus shown in the diagram.

- (i) State a use for this apparatus.
 (ii) Name a plant that could be used in this experiment.
 (iii) Suggest a control that could be used for this experiment.
 (iv) How would you ensure that the plant receives sufficient carbon dioxide?



(24)

13. (a) Explain the meaning of each of the following terms that are used in ecology:

omnivore, decomposer, predator, parasite. (24)

- (b) Name a habitat that you have studied. Name **three** plants and **three** animals that are usually present in this habitat.

The use of quadrats and capture-recapture techniques to estimate the number of organisms is common in the study of a habitat. Describe how you would carry out one of these techniques in a habitat you have studied. (27)

- (c) Describe an experiment to measure the amount of air OR water in a soil sample. (19)

14. (a) During the life cycle of a flowering plant the following take place:

germination, pollination, dormancy.

Give a brief account of each of these. (21)

- (b) List **three** factors that are essential for the germination of seeds. Describe an experiment to demonstrate that **one** of these factors is essential for germination. (24)

- (c) Seed dispersal takes place in the life cycle of flowering plants.

(i) Explain why seed dispersal is necessary.

(ii) State **three** ways in which seed dispersal takes place. Give an example in each case. (25)

15. Answer **two** of the following.

(35, 35)

- (a)
 - (i) Draw a diagram of a section through the human eye. Label **six** of the structures that you have drawn.
 - (ii) Explain what happens in the eye when a person changes focus from a distant object to a near one.
 - (iii) State the function of any **two** structures in the eye not mentioned in (ii).

- (b)
 - (i) Describe with the aid of a labelled diagram, the structure of a **named** insect.
 - (ii) Give an account of the life cycle of the bee or the butterfly.

- (c)
 - (i) What is digestion? Give **one** example in each case of physical (mechanical) digestion and chemical digestion.
 - (ii) Give an account of the digestion of carbohydrates as they pass through the alimentary canal.

- (d) Write notes on **four** of the following:
 - (i) Viruses.
 - (ii) Thyroid gland.
 - (iii) Binomial system of classification.
 - (iv) Yeast.
 - (v) Xerophytes.
 - (vi) Earthworms in agriculture.