

Write your Examination Number here

[Empty box for examination number]

AN ROINN OIDEACHAIS
LEAVING CERTIFICATE EXAMINATION, 1973

BIOLOGY—ORDINARY LEVEL

MONDAY, 18 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 any 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 the examination paper: enclose it in the answer-book you use for answering Part II.

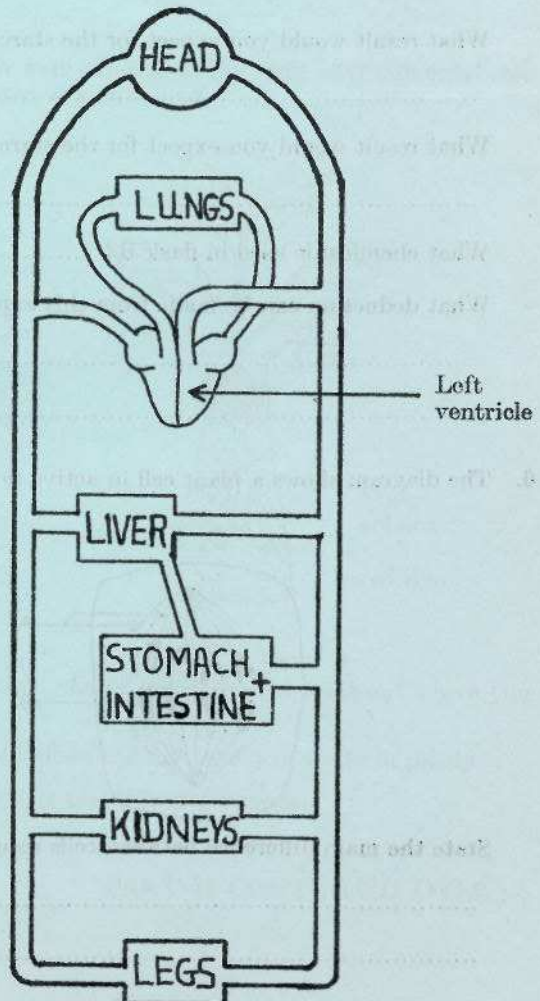
1. Answer five of the following:

- (a) What organ is connected to the kidney by the ureter?
- (b) What substance is transported in the xylem?
- (c) Name the vitamin, the lack of which can cause night blindness.
- (d) Name the process by which energy is released from foods in living cells.
- (e) What chemical substance are the genes composed of?
- (f) What chemical element is a constituent of proteins but not of carbohydrates?
- (g) Name the structures in leaves which control gas exchange with the environment.

2.

The diagram represents the circulatory system in the mammal. The position of the left ventricle is shown by an arrow. Show in the same way the position of each of the following:—aorta, hepatic portal vein, pulmonary artery, right atrium, renal vein.

Indicate the path taken by the blood from the heart (a) to the legs, (b) to the lungs.



3. Name one organism in each case that illustrates the following methods of body support.

- chitinous exoskeleton :
- bone :
- lignified cell wall :
- body fluid pressure :
- chalky shell :

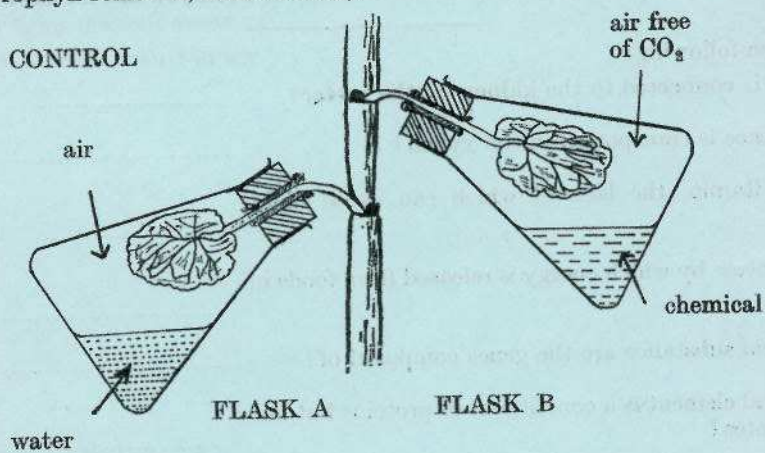
4. State one location of each of the following:

- (i) a ball and socket joint:
- (ii) a tendon:
- (iii) synovial fluid:

What is the function of synovial fluid?

.....

5. During a study of photosynthesis a green plant was first de-starched, then set up as shown in the diagram and allowed to photosynthesise for a few hours. The leaves in the flasks were then removed and subjected to a starch test (chlorophyll removed, iodine added).



What hypothesis is being tested?

.....

What result would you expect for the starch test on the leaf in flask A?

.....

What result would you expect for the starch test on the leaf in flask B?

.....

What chemical is used in flask B?

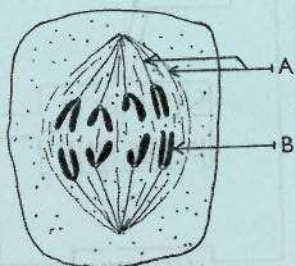
.....

What deduction can be made from this experiment?

.....

.....

6. The diagram shows a plant cell in active mitosis. Name the structures labelled A and B.



A.....

B.....

What stage of mitosis is shown?

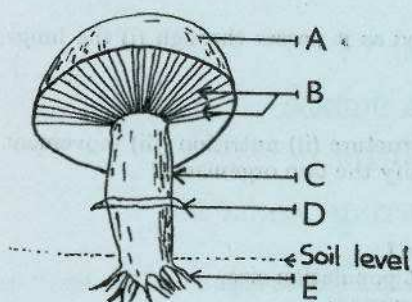
.....

State the main difference between cells resulting from mitosis and cells resulting from meiosis.

.....

.....

7. Name the parts marked A, B, C, D, E, in the diagram of the mushroom *Agaricus campestris*.



- A.....
 B.....
 C.....
 D.....
 E.....

Where are the spores formed?

PART II (280 marks)

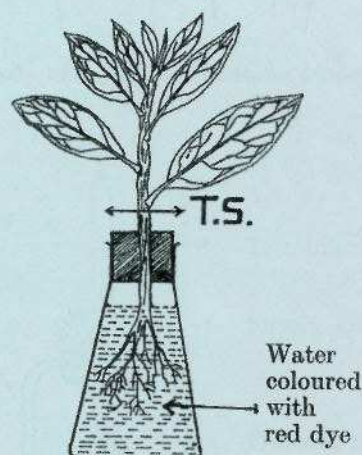
Write your answers to this part in your answer-book.

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.

8. (a) Draw a labelled diagram to show the parts of a flower. Describe the main differences between wind pollinated and insect pollinated flowers and give an example of each type.
 (b) What changes occur in the mammalian uterus to prepare it for the reception of the embryo? What does the term placenta refer to? Outline the functions of the placenta in the development of the embryo.
9. (i) Explain, with the aid of a labelled diagram of a reflex arc, what happens when your finger is accidentally pricked.
 (ii) State briefly the differences between hormones and nerves in relation to the rate and duration of their action in the body.
 (iii) Oat grains were germinated in darkness and when the coleoptiles were 3–4 cm in length their tips were removed. The seedlings were then exposed to light from one side. Explain why the coleoptiles do not bend in response to the light.
10. Two plants were each set up as shown in the diagram. Both were exposed to the same environmental conditions except that one was in a windy position while the other was in still air.

After about one hour the shoots were cut and a transverse section taken from each stem at the point indicated by T.S. in the diagram. The sections were examined under a microscope. The section from the plant in a windy position showed a red coloration in specific areas of the stem. The plant kept in still air showed no such coloration.



- (i) Suggest a hypothesis to explain this result.
 (ii) Draw a simple outline diagram of the transverse section. Label the parts and point out where you would expect the dye to be located.
 (iii) Name one other environmental condition which would affect the movement of water in plants.
 (iv) Describe briefly two morphological adaptations shown by plants in dry regions.

PART II CONTINUED OVER →

11. State concisely what is meant by excretion.
Outline the changes that take place in the composition of blood as it passes through (i) the lungs, (ii) the kidneys.
Describe an experiment to demonstrate osmosis.
12. Compare *Chlamydomonas* and *Amoeba* under the headings (i) structure (ii) nutrition (iii) movement (iv) re-
production. On the basis of your answers how would you classify the two organisms?
How may feeding in *Amoeba* be demonstrated?
13. What is meant by (i) habitat (ii) ecological niche (iii) population?
Discuss how predation, parasitism and migration can affect population size.
Outline the importance of decomposer organisms in the ecosystem.
14. When two white cats are mated they produce white kittens and black kittens with about three times as
many white as black.
Answer the following, making use of the terms homozygous, heterozygous, dominant and recessive,
where appropriate:
 - (i) Explain how this cross produced black kittens and white kittens.
 - (ii) Explain how pure-breeding white cats can be bred from the white progeny of the cross.
15. Describe experiments, one in each case, to demonstrate the following:—
 - (i) the effects of a deficiency of potassium on the growth of plants,
 - (ii) the action of the salivary enzyme on starch,
 - (iii) the presence of bacteria in air.



After about one hour the shoots were cut and a transverse section taken from each stem at the point indicated by T. The sections were stained with a microscopic stain. The section from the plant in a nutrient solution showed a red coloration in the vascular tissue. The plant kept in still air showed no such coloration.

- (i) Suggest a hypothesis to explain this result.
- (ii) Draw a simple outline diagram of the transverse section. Label the parts and note out where you would expect the dye to be located.
- (iii) Name the other environmental condition which would affect the movement of water in plants.
- (iv) Describe briefly two morphological adaptations shown by plants in dry regions.