

Write your Examination Number here

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AN ROINN OIDEACHAIS LEAVING CERTIFICATE EXAMINATION, 1971

BIOLOGY—ORDINARY LEVEL

MONDAY, 21st JUNE—AFTERNOON, 2 to 4.30

Answer all the questions in Part I and any five questions from Part II. You should not spend more than 40 minutes on Part I, leaving about 100 minutes for Part II.

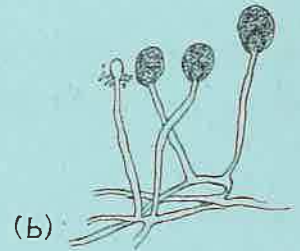
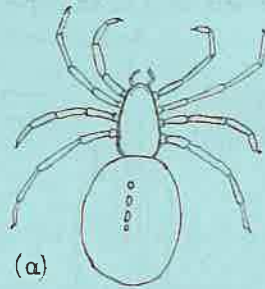
PART I (120 marks)

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. (a) Name the substance in the red blood cells which combines with the oxygen in the lungs. (b) Name the juice secreted by the liver into the small intestine. (c) What is the loss of water by evaporation through the aerial parts of a plant called? (d) What is the response of roots to gravity called? (e) What substance, together with carbon dioxide, is formed during anaerobic respiration of yeast? (15 marks)

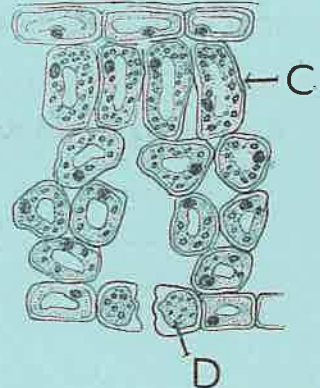
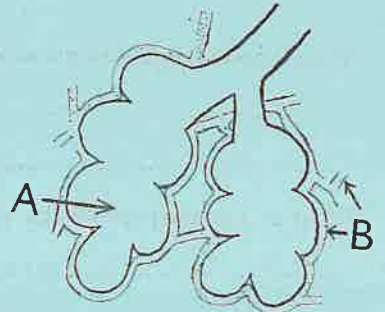
- 2. The diagrams show two organisms. Name the group of organisms to which each belongs. (a) (b) Give two characteristics of one of these groups which would help you identify its members. (i) (ii)



(12 marks)

- 3. The diagrams show a section through lung tissue and a vertical section through a leaf.

Name the structure marked A Name the structure marked B Name the layer of cells marked C Name the cell marked D



What function have both organs in common? [Dotted lines for answer]

(18 marks)

4. Name the structures marked A, B, C in the diagram of the ear.

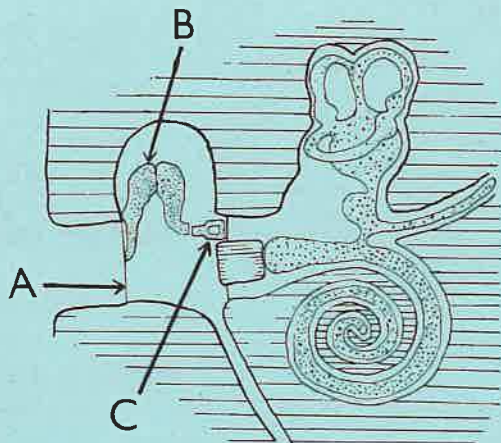
A

B

C

Draw in on the diagram

- (i) an arrow marked X to show the region concerned with balance,
- (ii) an arrow marked Z to show the region immediately concerned with converting sound impulses into nerve impulses.



(15 marks)

5. What is an enzyme?

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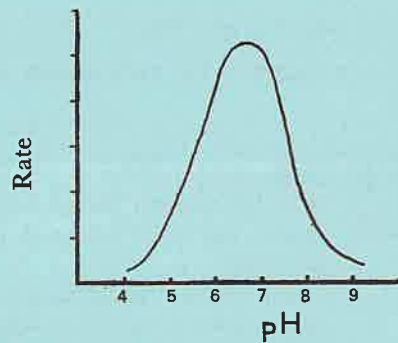
What is meant by pH?

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The graph shows the rate of a certain reaction which depends on the action of an enzyme.

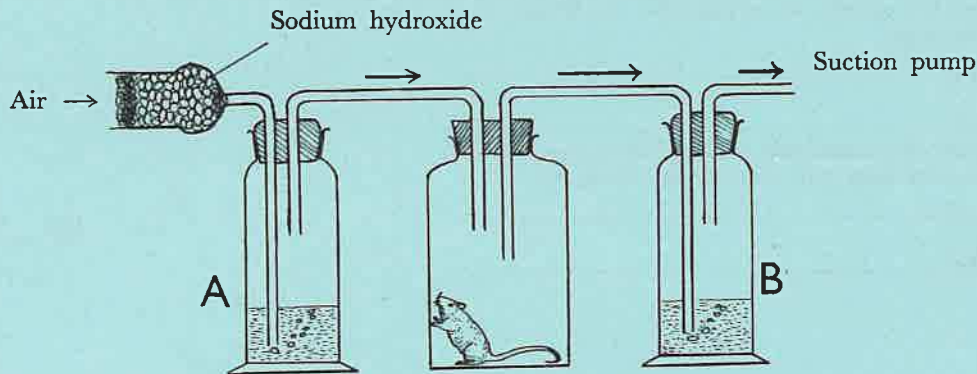
What does the graph tell you about the action of the enzyme?

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(18 marks)

6. The apparatus shown below was used in an experiment on respiration.



What hypothesis is being tested in this experiment?

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What is the purpose of the sodium hydroxide (caustic soda)?.....

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What solution would you put in bottles A and B?.....

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What would you expect to observe in this experiment?.....

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What difficulty would arise on a bright day if a green plant were used instead of the mouse?.....

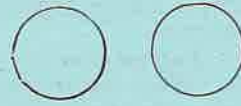
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(21 marks)

7. A pure breeding black bull was crossed with a pure breeding red cow. The cross is shown diagrammatically below.

Parents BB × bb
Black Red
dominant recessive

Show the gamete type produced by each parent



State the genotype and phenotype of the F₁ generation { Genotype
Phenotype

If an F₁ bull were crossed with an F₁ cow what phenotypes would result and in what ratio?

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(21 marks)

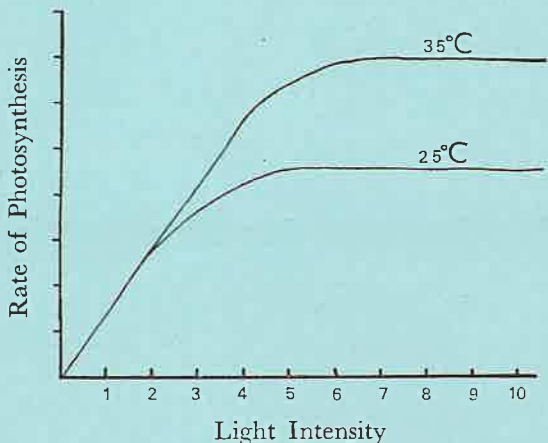
PART II (280 marks)

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

Answer any five questions. Each question carries 56 marks.

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

- 8. State the type of habitat most favoured by (i) mosses and (ii) ferns. What features of the vegetative structure and reproductive cycle of these organisms tend to limit them to their habitats?
- 9. What is a parasite? Give three ways in which parasites are adapted to their mode of life. Show by means of diagrams the various stages in the life cycle of a parasitic animal you have studied. How does a knowledge of this life cycle assist man in the control of the parasite?
- 10. Explain the terms (i) producers, (ii) consumers, (iii) ecological niche, with the aid of examples from an ecosystem you have studied. Give a brief account of how the distribution of organisms in the ecosystem has been influenced by the abiotic features of the ecosystem.
- 11. Describe what happens in the reproductive tract of the female mammal when an ovum passes through it without being fertilised (menstrual cycle). List four major features (e.g. the production of gametes) that are common to the production of a dicotyledonous seed and the production of a new human being. Write about three lines to explain each feature you list.
- 12. The graph shows the effect of light intensity on the rate of photosynthesis at two different temperatures. An ample supply of carbon dioxide and water was provided in this experiment.



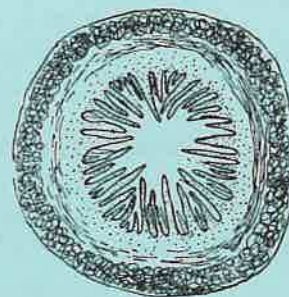
- (i) From the graph it can be seen that up to a certain level of light intensity the difference in temperature has little effect on the rate of photosynthesis. At what light intensity does the temperature begin to affect the rate?
- (ii) Why does the light intensity affect the rate?
- (iii) At 35°C the rate of photosynthesis is independent of the light intensity above a certain intensity. What intensity is this?
- (iv) Why was an ample supply of carbon dioxide provided during this experiment?
- (v) What is meant by compensation point?

13. In what parts of the human alimentary tract are carbohydrates broken down? Where are the principal enzymes involved produced? What substance does each of those enzymes act upon, and what substances are produced?

Describe a simple experiment to demonstrate the effect of one of those enzymes.

In the diagram you are shown a transverse section of the small intestine. What feature shown aids maximum absorption? Explain.

How does the transport of carbohydrates differ from the transport of fats following absorption from the intestine?



14. What is meant by diffusion, osmosis, active transport (active absorption)? Draw a labelled diagram of a kidney tubule and give a short account of what happens in the various regions shown. Why do plants not need an organ like the kidney?
15. What difference is there between flowering plants and animals in the way they respond to external stimuli? How do you account for the difference? Name two ductless glands in the human body. Say where they are located and give the principle function of one hormone produced by each. When some oat seeds were germinated the coleoptiles were seen to bend towards a source of light. How would you test the hypothesis that the hormone responsible for the bending is produced in the tip of the coleoptiles?
16. List three functions of the nucleus of the cell and name the main structures involved in these functions. Name the major chemical substance in these structures that is involved in the control of their functions. Genes may be linked together. Show by means of a diagram what this means. Draw another diagram to illustrate crossing-over between linked genes. Suggest one benefit arising from the occurrence of crossing-over between linked genes.
17. Describe an experiment you would carry out in the laboratory to show that micro-organisms (bacteria and fungi) are present in soil. Give an account of the part played by soil micro-organisms in the circulation of materials in the ecosystem.