UNIVERSITIES OF MANCHESTER LIVERPOOL LEEDS SHEFFIELD AND BIRMINGHAM

Joint Matriculation Board

General Certificate of Education

# BIOLOGY. PAPER II

ADVANCED

THURSDAY 24 JUNE 1954, 9.30-12.30

*Answer* **five** *questions.*

**Answers to Sections (1) and (2) must be written in different answer-books.**

*The books must be marked clearly either* SECTION (1) *or* SECTION (2) *and handed in to the Supervisor separately.*

**Answers should be illustrated by sketches wherever possible.**

*Candidates should wherever possible show by their answers that they have seen or themselves performed experiments on the subjects they are discussing.*

## SECTION (1)

**1.** By reference to a mammal show, *in general terms*, how control of body activities is carried out by the nervous system. Explain how the principal sense organs are related to the controlling mechanism.

**2.** Describe the constitution of lymph. Explain the relationship between blood and lymph. Show, with as much detail as you can, how each of these tissues plays an essential part in the nutrition of a mammal.

**3.** What are the different forms of the honey bee? How would you distinguish specimens of these from one another? Give an account of the various activities of the kind of honey bee which is normally seen flying about in a garden, from the time at which it becomes an imago.

**4.** Explain as fully as you can how (*a*) change of shape and (*b*) locomotion are brought about in each of the following: *Amoeba*, *Euglena*, *Hydra*.

**5.** In what way are chromosomes believed to be connected with inheritance? Illustrate this connection by means of an example. In some cases inheritance is affected by sex: explain briefly why this happens.

## SECTION (2)

**(Answers to be written in a separate answer-book.)**

**6.** If you wanted to keep specimens of *Amoeba*, *Euglena*, *Hydra*, and *Spirogyra* in the same container, what conditions would you need to arrange for this to be successful?

It might happen that the water in the container gradually dries up and yet, when more water is added, specimens of each of the four organisms reappear, even though the container has been covered throughout. Explain how each of the organisms had contrived to withstand the dry conditions.





**7.** Describe with the aid of drawings the structure of bone as seen in sections under the microscope. Explain the way in which bones serve in the mechanism of support and movement in an animal such as the rabbit.

**8.** **Either** (*a*) Give an account of any differences in morphology, life history, etc., which you have observed between the various members of any one group of animals or plants which you have studied.

**Or** (*b*) If you have studied 'in the field' the fauna and flora of *one* habitat, explain (i) any relationships which you have observed between the plants and animals, and (ii) any effects of considerable cold and heat on the plants and animals.

**9.** Show how both animals and plants are concerned in the circulation of carbon and nitrogen in nature.

UNIVERSITIES OF MANCHESTER LIVERPOOL LEEDS SHEFFIELD AND BIRMINGHAM

Joint Matriculation Board

General Certificate of Education

# BIOLOGY. PAPER I

ADVANCED

TUESDAY 22 JUNE 1954, 2-5

*Answer* **five** *questions.*

**Answers to Sections (1) and (2) must be written in different answer-books.**

*The books must be marked clearly either* SECTION (1) *or* SECTION (2) *and handed in to the Supervisor separately.*

**Answers should be illustrated by sketches wherever possible.**

*Candidates should wherever possible show by their answers that they have seen or themselves performed experiments on the subjects they are discussing.*

## SECTION (1)

**1.** Describe the structure of a typical green leaf and show how this is related to its function.

**2.** Give an account of the life histories of a parasitic and of a saprophytic fungus, pointing out the features which are significant for their particular modes of life.

**3.** Describe and compare the germination of a dwarf French bean with that of a broad bean.

**4.** Give an account of the structure, life history and physiology of a named aquatic alga showing how particular features are related to its environment.

**5.** For what purposes are foodstuffs stored in plants? What substances are stored and in what different organs are they found? Illustrate your answers by brief reference to specific examples.

SECTION (2)

**(Answers to be written in a separate answer-book.)**

**6.** Compare the process of growth and differentiation in the shoot apex with that in the root tip of a herbaceous dicotyledon.

**7.** What is meant by soil fertility? What properties would you look for in assessing the fertility of a particular soil?

**8.** Describe the processes concerned in the movement of water in a plant.

**9.** What are the chief differences between wind pollinated and insect pollinated flowers? Describe the mechanism of pollination in one *named* insect pollinated flower.

ALTERNATIVE A

UNIVERSITIES OF MANCHESTER LIVERPOOL LEEDS SHEFFIELD AND BIRMINGHAM

Joint Matriculation Board

General Certificate of Education

# PRACTICAL BIOLOGY. ALTERNATIVE A

ADVANCED

THURSDAY 3 JUNE 1954, 2-5

**Answers to Sections (1) and (2) must be written in different answer-books.**

*The books must be marked clearly either* SECTION (1) *or* SECTION (2) *and handed in to the Supervisor separately.*

*Microscopes will be provided by the Supervisor.*

## SECTION (1)

**1.** Specimen **A** is a preserved portion of a plant infected by a parasitic fungus. By drawings from longitudinal sections show the manner in which the fungus is invading the plant, and indicate especially any morphological characteristics of the fungus you can recognize. The stain provided may be used.

Preparations and drawings must be left for inspection by the Supervisor.

**2.** Identify and make a clear labelled drawing of specimen **B**.

SECTION (2)

**(Answers to be written in a separate answer-book.)**

3. Dissect the thorax of the mammal provided to show as much as you can of the heart and the principal arteries in this region. Make an accurate labelled drawing of your dissection. Leave your dissection and drawing for inspection by the Supervisor.

4. Identify and write very short notes (not more than five lines) on, but do not draw, specimens P and Q.