

UNIVERSITIES OF MANCHESTER LIVERPOOL
LEEDS SHEFFIELD AND BIRMINGHAM

JOINT MATRICULATION BOARD

General Certificate of Education

BIOLOGY

Ordinary

Wednesday 24 June 1964 2—4-30

Negligence and slovenliness in the presentation of answers will be penalized.

In the special answer-book provided answer Question 1 and any four other questions.

Credit will be given for labelled diagrams where relevant.

Any answer, either finished or unfinished, which you wish to cancel should be boldly crossed out.

Answers may be continued on the extra space provided on pages 5, 11, 13 and 20 but indication must be given as follows "Continued on page ...".

Question 1, which is compulsory, is printed on pages 2 and 3 of the special answer-book.

2. (a) (i) If a small mammal, such as a rabbit, accidentally presses a foot on a projecting thorn, what reaction would you expect the mammal to make? (ii) With the help of a large, fully-labelled diagram, explain how this reaction is brought about.

(b) How would (i) *Amoeba* and (ii) *Euglena* react to obstacles in their paths?

pages 4 and 5

3. Approximately 100 soaked pea seeds are planted in each of three boxes of moist loam. They are all kept in the same warm air conditions, but one, Box A, is kept in a closed cupboard; the second, Box B, is kept in the light; while the third, Box C, is covered by a much larger inverted box in which a long narrow slit has been cut from the top to the bottom of one side.

- (a) What differences would you expect to find in the growth and condition of the seedlings in the three boxes a week after germination? Give an explanation for these differences.
(b) Describe in detail a method by which you would demonstrate the importance of light in the *nutrition* of a fully-grown green plant.
(c) Explain how animals are dependent upon green plants by referring to **two named** examples of animals you have studied.

pages 6 and 7

4. Study the following table, giving rates of breathing movements per minute, observed in a mammal:

	<i>Rate of breathing movements per minute</i>	<i>Condition of mammal</i>
i	10	sleeping
ii	26	actively moving
iii	18	feeding

- (a) Give an explanation for the differences in rates of breathing as shown in the table.
(b) Make **two large labelled diagrams**, one to show the organs through which air flows during these breathing movements, the other to show the structures through which gases enter or leave the blood.
(c) Describe how these breathing movements are brought about.

pages 8 and 9

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5. (a) State where and under what conditions you would expect to find *Mucor* growing.
 (b) With the help of diagrams, describe the process of asexual reproduction in *Mucor*. Under what conditions does this process usually occur?
 (c) Using *Mucor* and a *named* animal as examples, describe the essential differences between asexual and sexual reproduction (a detailed account of the processes in each organism is **not** required).

pages 10 and 11

6. (a) Make a large, labelled diagram of a vertical section through a newly laid egg of a bird.
 (b) How does this egg differ structurally from (i) a frog's egg; (ii) a mammalian egg?
 (c) What are the functions of the placenta? Why is a placenta unnecessary during the development of a frog and a bird?

pages 12 and 13

7. (a) Using a *named* example of each to illustrate your answer, distinguish between symbiosis and parasitism.
 (b) Describe, with the help of diagrams, the methods of nutrition and attachment of (i) a *named* total plant parasite; (ii) a *named* partial plant parasite; (iii) a *named* animal parasite.

pages 14 and 15

8. (a) Make a large, labelled diagram of a winter twig of a *named* deciduous tree.
 (b) What adverse conditions face the plants and animals of this country in winter?
 (c) How is survival during winter ensured by (i) deciduous trees; (ii) annual herbaceous plants; (iii) frogs; (iv) butterflies or moths?

pages 16 and 17

9. (a) Make a fully-labelled drawing of a half flower of a buttercup.
 (b) Give the functions of each of the parts you have labelled.
 (c) Make a list of **three** differences between insect-pollinated and wind-pollinated flowers.
 (d) Explain how the structure of (i) a *named* seed, and (ii) a *named* fruit enable them to be dispersed by wind.

pages 18 and 19