EXAMINATIONS COUNCIL OF ZAMBIA

Joint Examination for the School Certificate and General Certificate of Education Ordinary Level

BIOLOGY
PAPER 2 Theory

Wednesday 13 NOVEMBER 2002

Additional materials:
Answer paper

TIME: 1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES
Write your name, centre number and candidate number in the spaces at the top of this page and on all separate answer papers used.
There are ten questions in this paper.

Section A
Answer all questions.
Write your answers in the spaces provided on the question paper.

Section B
Answer any three questions.
Write your answers on the separate answer paper provided.
At the end of the examination,
1. fasten all separate answer paper used securely to the question paper,
2. enter the numbers of the Section B questions you have answered in the grid below.

INFORMATION FOR CANDIDATES
The intended number of marks is given in brackets [ ] at the end of each question or part question.
You are advised to spend no longer than one hour on Section A and no longer than 45 minutes on Section B.

FOR EXAMINER'S USE

<table>
<thead>
<tr>
<th>Section A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section B</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th></th>
</tr>
</thead>
</table>
Section A

Answer all questions in this section

1. Figure 1.1 shows tissues from organisms.

(a) (i) Name tissue A.

........................................................................................................ [1]

(ii) What is tissue D?

........................................................................................................ [1]

(iii) Where do you find tissues C and D?

Tissue C................................................................................................. [1]

Tissue D................................................................................................. [1]

(b) Describe how the tissues C and D are adapted to their functions.

Tissue C ...........................................................................................................

.................................................................................................................

................................................................................................................. [2]

Tissue D ........................................................................................................

.................................................................................................................

................................................................................................................. [2]

[Total: 8]
2. Figure 2.1 shows sections of blood vessels R and S.

![Image of blood vessels R and S]

**Fig 2.1**

(a) (i) Name the type of blood vessels shown in Fig. 2.1.

Blood Vessel R .................................................................................. [1]

Blood Vessel S .................................................................................. [1]

(ii) Describe structural differences between the blood vessels R and S.

.............................................................................................................

.............................................................................................................

............................................................................................................. [2]

(b) Two patients went to the hospital on suspicion that they had malaria infection. Their blood samples revealed the following.

Patient x – had no malarial parasites and was anaemic.

Patient y – had malarial parasites and was anaemic.

(i) Explain how malaria can cause anaemia.

............................................................................................................. [2]

(ii) State other possible causes of anaemia in patient x.

............................................................................................................. [1]

(iii) Patient x with blood group A needed blood transfusion. Name a possible donor.

............................................................................................................. [1]

[Total: 8]
3. Figure 3.1 shows two cross sections from different parts of a dicotyledonous plant.

![Plant Part W and Plant Part V](image)

Fig. 3.1

(a) Which diagram shows the cross section of (i) root, (ii) stem? Explain your answer.

(i) Root ................................................................. [1]
Explanation: ................................................................. [1]

(ii) Stem ................................................................. [1]
Explanation: ................................................................. [1]

(iii) What are the shaded regions in the diagrams? Give the reasons for their different distributions.
Shaded regions. ................................................................. [1]
Reasons: ................................................................. [1]

(b) Herbaceous stems and woody stems were clamped in water (Fig. 3.3) and concentrated salt solution (Fig. 3.4) as shown below.

![Herbaceous stem in water and Woody stems in salt solution](image)

Fig. 3.3  Fig. 3.4
(i) Describe what will happen in Fig. 3.3 and Fig. 3.4. Explain your answers.
Fig. 3.3................................................................................................................................. [1]
................................................................................................................................. [1]
Explanation: ...................................................................................................................... [1]
................................................................................................................................. [1]
Fig. 3.4................................................................................................................................. [1]
................................................................................................................................. [1]
Explanation: ...................................................................................................................... [1]
[Total: 10]

4. Figure 4.1 shows the changes in size of a population of producers and of a population of consumers in a lake over several months.

![Graph showing population changes over months]

(a) What is meant by producer in a food chain?
................................................................................................................................. [1]

(b) Which graph, x or y, represents the consumers?
Explain your answer.
(i) Graph ...................................................................................................................... [1]
(ii) Explanation .............................................................................................................. [1]
(c) The change in population size of the producers between the months of June and September was a result of farming around the lake. Suggest how farming methods may have caused this change.

................................................................. [2]

(d) A biologist studying the lake several weeks after September found that the size of both populations had fallen greatly while the number of bacteria were very high.

(i) What term is used to describe this effect?

................................................................. [1]

(ii) What are the disadvantages of this process?

................................................................. [2]

(e) Explain the relationship between graphs x and y.

................................................................. [1]

[Total: 9]

5. A farmer carried out a research by cross-breeding a white corn variety and a brown corn variety. Most of the cobs that developed had white corns. The farmer then planted some of the white seeds (Batch 1) and the plants were allowed to self pollinate. Most of the cobs that developed from these crops (Batch 2) had a mixture of brown and white corns on them as shown in fig. 5.1.

![Maize cob](image)

Maize cob

Fig. 5.1

The farmer randomly collected five cobs (Batch 2) and counted the corns on each cob.
Table 5.1 shows the number of corns from each of the five cobs.

<table>
<thead>
<tr>
<th></th>
<th>Number of white corns</th>
<th>Number of Brown corns</th>
<th>Number of purple corns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cob 1</td>
<td>21</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Cob 2</td>
<td>17</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Cob 3</td>
<td>52</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Cob 4</td>
<td>30</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Cob 5</td>
<td>36</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Total number of corns</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5.1

(a)  
(i) Calculate the total number of corns of each colour on Table 5.1

(ii) What is the ratio of white to brown corns?

(iii) Which colour is dominant?

(iv) Using alleles B and b, and genetic diagrams explain how the seeds from batch 1 could give such results as shown in Table 5.1.

(b) On examining the cobs, the farmer noticed that cob 5 had one corn which was purple coloured.

(i) Suggest the process which most likely brought about purple colour in cob 5

(ii) Assuming the allele for purple colour in this cob is recessive, briefly explain how, the farmer would obtain many seeds which are purple coloured from the one seed.

[Total: 9]
Section B

Answer **three (3)** questions from this section.

6. In a biology experiment, a student used two tissues, liver (tissue A) and unripe pawpaw (tissue B). These were immersed in a concentrated salt solution.

   (a) Explain what happened to tissue A and tissue B when they were immersed in the concentrated salt solution. [3]
   (b) Describe how the changes in tissue A and tissue B were brought about. [4]
   (c) (i) Define the process involved in (b) above. [3]
       (ii) How is this process important to plants and animals. [2]

[Total: 12]

7. (a) Explain how asexual reproduction differs from sexual reproduction. [4]
   (b) Describe the events which take place in a flower following fertilization and leading to the formation of a fruit. [8]

[Total: 12]

8. The soil is considered as bread of life.
   (a) Explain how agriculture can lead to loss of soil fertility. [6]
   (b) What role do insects play in the improvement of soil fertility? [3]
   (c) Explain the importance of bacteria and fungi in the soil to plant growth. [3]

[Total: 12]

9. (a) Explain the following terms using specific examples of drugs.
       (i) A stimulant [3]
       (ii) A depressant [3]
   (b) (i) Why is it not easy to give up smoking? [4]
       (ii) Explain how cigarette smoke can cause coronary heart disease. [2]

[Total: 12]

10. (a) Explain the following terms.
       (i) Pathogen [3]
       (ii) Vector [3]
   (b) Describe ways in which pathogens of the following diseases can enter the body:
       (i) Malaria [3]
       (ii) Gonorrhoea [3]

[Total: 12]
DOWNLOAD ECZ
PAST PAPERS
FROM YOUR
PHONE OR PC

www.zedpastpapers.com