THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

8332

# BIOLOGY 2
## ALTERNATIVE TO PRACTICAL
(For Both School and Private Candidates)

Time: 2 Hours 30 Minutes Tuesday, October 18, 2005 a.m.

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Instructions

1. This paper consists of five (5) questions.
2. Answer all questions.
3. Each question carries 10 marks.
4. Electronic calculators are not allowed in the examination room.
5. Cellular phones are not allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet.

This paper consists of 4 printed pages.

1. Five powered foods: M, N O , P and Q were tested for starch, reducing sugar and protein by using iodine, Benedict's reagent and Buiret's test reagents respectively the final colour change for each test was recorded as shown in the table below.

| Type of test | M | N | O | P | Q |
|---|---|---|---|---|---|
| Starch test | Black | Black | Brown | Black | Brown |
| Benedict's test | Orange | Blue | Blue | Orange | Blue |
| Buiret's test | Green | Green | Purple | Purple | Blue |

(a) Which powder contained

(i) protein only

(ii) starch only

(iii) starch and reducing sugar

(iv) glucose, starch and protein

(v) non of the food substances tested?

(b) Which test required heating?

(c) Describe two (2) different procedures which can be used to test for the presence of fats in groundnut seeds.

(d) Is the fat present in groundnuts water soluble or fat soluble?

2. Samples of animals living on the surface of logs in a woodland were collected. The animals found on the top and sides were brushed carefully into a tray. The animals found on the underside of the logs were brushed carefully into a second tray. The animals were identified, sorted into groups and counted. The findings were recorded in the table below.

| Animal group | Feeding group | Number of animals | |
|---|---|---|---|
| | | Top and side of log | Underside of log |
| Snails | Herbivores | 4 | 3 |
| Mites | Herbivores | 12 | 9 |
| Fly larvae | Herbivores | 1 | 8 |
| Centipedes | Carnivores | 0 | 5 |
| Spiders | Carnivores | 2 | 7 |
| Beetles | Carnivores | 2 | 4 |
| Woodlice | Detrivores | 2 | 10 |
| Millipedes | Detrivores | 1 | 4 |

Detrivores eat dead matter such as dead fallen leaves.

(a) (i) Copy and complete the table below to show the total number of animals in each feeding group expressed as a percentage of the total number of animals occurring on the underside of the logs.

| Feeding group | Number of animals found on the underside of the log | Percentage % |
|---|---|---|
| Herbivores | 20 | |
| Carnivores | 16 | |
| Detrivores | 14 | |
| **Total** | 50 | 100 |

(ii) Construct a pie chart to show the proportion of herbivores, carnivores, and detrivores collected from the underside of the logs.

(b) Suggest **two (2)** reasons why most animals were found on the underside of the logs.

(c) Describe an investigation you could carry out to compare the number of animals living among fallen leaves in two different woodland habitats.

3. An experiment was carried out to find out the effect of different concentrations of sucrose on the length of potato strips.

Five test tubes containing different concentrations of sucrose solution were set up. A sixth test tube containing the same volume of distilled water was set up. Potato strips of the Same size, 70 x 10 x 2, length, width and breadth respectively were immersed in each of the test tubes.

The strips were left in the tubes for 30 minutes, removed and measured. The results are shown in the table below.

| Concentration of sucrose solution (mol $dm^{-3}$) | Initial length (mm) | Final length (mm) | Change in length (mm) |
|---|---|---|---|
| 0.0 | 70 | 73.0 | |
| 0.2 | 70 | 71.5 | |
| 0.4 | 70 | 69.0 | |
| 0.6 | 70 | 67.0 | |
| 0.8 | 70 | 66.0 | |
| 1.0 | 70 | 64.5 | |

(a) (i) Copy and complete the table above to show the changes in length of each strip.

(ii) Draw a graph of change in length against the concentration of sucrose solution on the graph paper provided in your answer booklet.

(b) (i) What conclusion can you draw from these results?

(iii) Name the process that has taken place to bring about these changes in the lengths of the potato strips.

(e) State **two (2)** improvements to this experiment which could increase the reliability of these results.

4. Study the organisms represented by figures 1, 2, 3 and 4. Then answer the answer the question which follows.

Figure 1

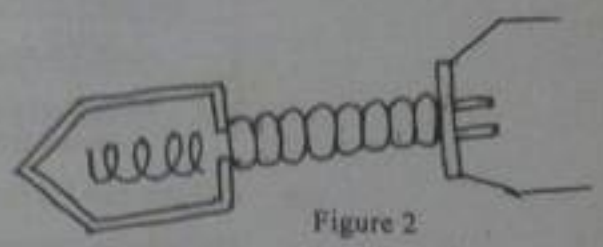

Figure 2

Figure 3

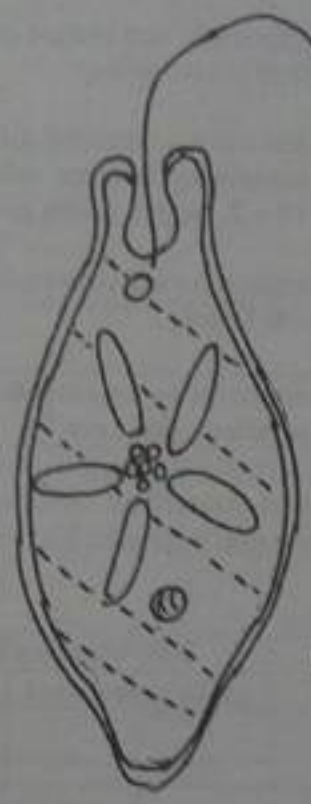

Figure 4

(a) Provide common names for the organisms represented by figures 1 to 4.

(b) (i) Name the kingdom to which each organism in figures 1, 3 and 4 belong.

(ii) State two (2) general features of the organisms in figures 1 and 3.

(c) State reasons why the organism in Figure 2 is considered to be both living and non-living.

(d) In which way is the organism in Figure 3 similar and yet different from the organism in figure 4?

5. (a) Draw neat and large diagrams of spirogyra and mucor and label them fully.

(b) List down the structural differences between the two organisms in 5. (a) above.