THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

0332/2 BIOLOGY 2

ALTERNATIVE TO PRACTICAL

(For Both School and Private Candidates)

TIME: 2½ Hours 7 November 2000

Instructions

1) This paper consists of FOUR (4) questions.

2) Answer ALL questions.

3) The mark allocation is indicated in parentheses at the end of each question.

4) Except for diagrams, which must be drawn in pencil, all writing should be in blue/black ink or ball point pen.

5) Write your Examination Number on every page of your answer booklet(s).

This paper consists of 4 printed pages.

1. Three food solutions S_1, S_2 and S_3 were made from a sugar cane, germinating maize seeds and maize grains respectively. When a starch test, a reducing sugar test and a non-reducing sugar test were carried out for each of the three solutions, the results were as shown in table 1 below.

Table 1

Type of test	Observed results		
	Solution S_1 (sugar cane)	Solution S_2 (germinating maize seeds)	Solution S_3 (maize grains)
Starch test	Solution retained colour of iodine	Solution retained colour of iodine	Dark – blue colouration formed
Reducing sugar test	Solution retained colour of Benedict's solution	Brick-red/orange precipitate formed	Solution retained the blue colour of Benedict's solution
Non-reducing sugar test	Green/brown precipitate formed	Solution retained the blue colour of Benedict's solution	Solution retained the blue colour of Benedict's solution

(a) From the above results, what conclusion can be drawn about the type of carbohydrates contained in solutions S_1, S_2 and S_3?
(b) In a point form, write down the procedure you would follow to carry out the starch, reducing sugar and non-reducing sugar tests on solutions S_1, S_2 and S_3.
(c) Give reasons to explain why there is a difference in the type of carbohydrates contained by germinating maize seeds (S_2) and maize grains (S_3).

(13 marks)

2. Two experiments were conducted using the apparatus set ups described below.

Experiment I

Some soaked beans were pushed into a test-tube completely filled with oil. The tube was then inverted in a dish containing oil and the apparatus connected as shown in figure 1 A below. A second apparatus figure 1 B, exactly like the first, was set but using boiled soaked beans.

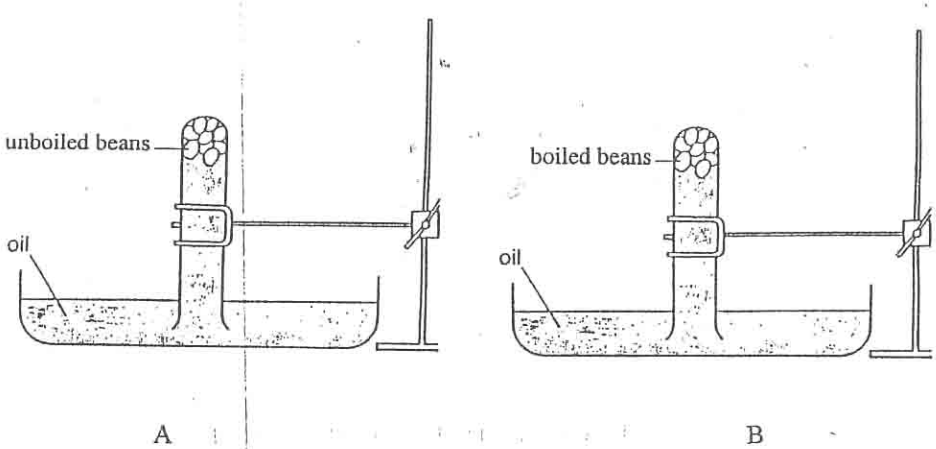

Figure 1

The above experiment was left to stand for 24 hours.

Experiment II

Some unboiled soaked bean seeds and boiled soaked bean seeds were washed in 10 % formalin and then placed in 2 vacuum flasks labelled C and D respectively. A thermometer was fitted into each of the flasks as shown in Figure 2 below. The experiment was left to stand for 3 days.

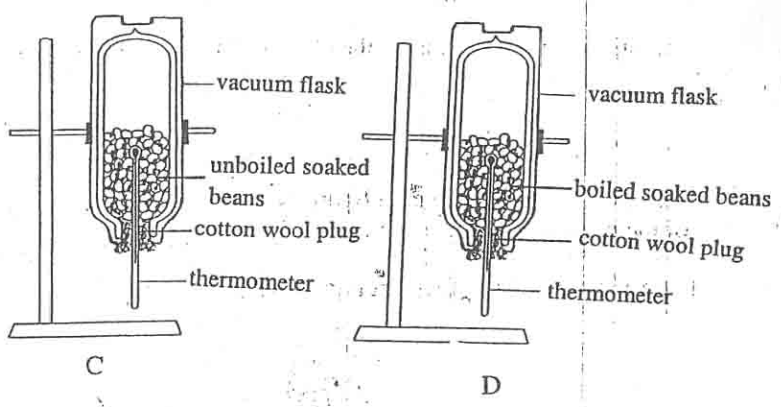

Figure 2

(a) (i) Name a biological process which was being investigated in experiments I and II.

(ii) What is the importance of this process to living organisms?

(b) (i) Suggest the aim of each experiment.

(ii) Which of the two sets of apparatus in figures 1 and 2 is a control experiment?

(c) Write down the possible observations made at the end of each experiment and explain them.

(d) (i) Why were the seeds in experiment II washed in 10 % formalin?

(ii) Why were vacuum flasks used instead of ordinary flasks?

(iii) Why do you think the flasks were set upside down?

(iv) Draw conclusions for the two experiments.

(12 marks)

3. Study the organisms represented by figures 3, 4, 5 and 6.

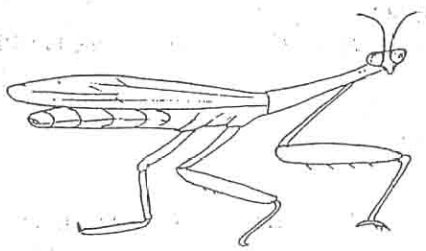

Figure 3

Figure 4

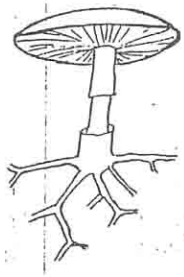

Figure 5

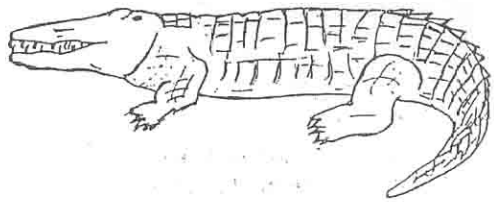

Figure 6

(a) Identify the organisms in figures 3 to 6 by their common names.
(b) (i) Name the phylum to which each organism belongs.

(ii) Give two distinguishing characteristics of the classes to which organisms in figures 3 and 6 belong.

(b) State

(i) the mode of nutrition for the organism in figure 5.
(ii) the habitats of the organisms in figures 4 and 6.

(12 marks)

4. Figures 7, 8, 9 and 10 below, represent different types of fruits

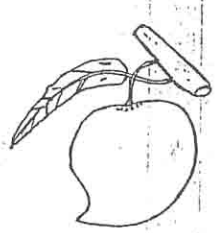

Figure 7

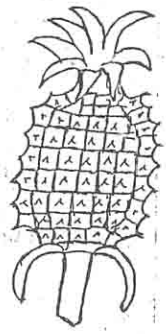

Figure 8

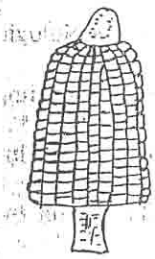

Figure 9

Figure 10

figures 7 – 10

(a) (i) Identify the above fruits (figures 7 – 10) by their common names.
(ii) Which fruit is a caryopsis and which one is a drupe?

(b) (i) Which one of the four fruits is a false fleshy fruit?
(ii) Which part of the original flower is the fleshy part of the fruit you have named in 4(b)(i) formed from?

(c) (i) How is the seed of the fruit in figure 7 dispersed?
(ii) How is the fruit adapted for this kind of dispersal?

(c) Draw large labelled diagrams of longitudinal sections of the fruits represented by figures 7 and 8.

(13 marks)