

JUNIOR LYCEUM ANNUAL EXAMINATIONS 2003

Educational Assessment Unit – Education Division

FORM 3

BIOLOGY

TIME: 1hr 30 mins

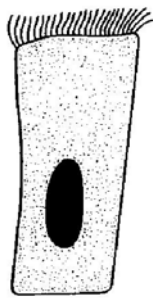
Name: _____

Class: _____

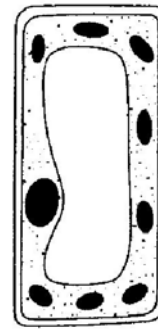
SECTION A This section carries 55 marks.

ANSWER ALL QUESTIONS IN THE SPACE PROVIDED.

1. The following diagrams show cell A and cell B.



A



B

a) Which of these cells is :

(i) a plant cell _____ (ii) an animal cell _____? (2)

b) Which two structures shown in the diagrams helped you to give an answer to 'a'?

_____ (2)

c) The main function of the plant cell shown in the diagram is photosynthesis.

(i) What is 'photosynthesis'?

_____ (1)

(ii) In which part of the plant can the plant cell, shown in the diagram, be found?

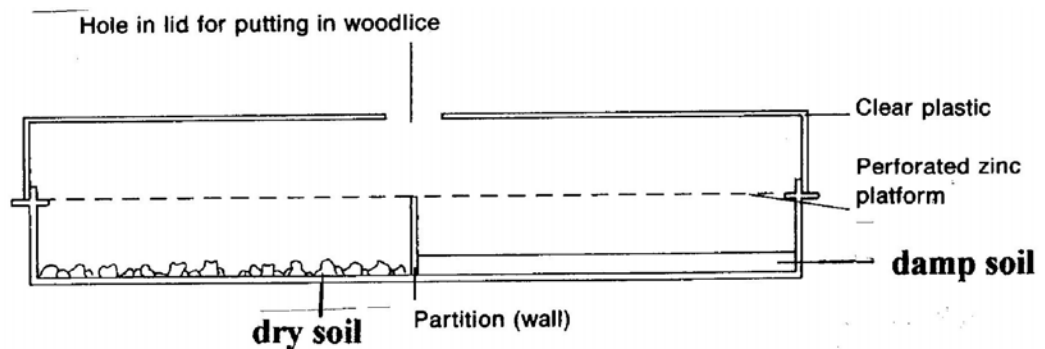
_____ (1)

(iii) Give one adaptation of the plant cell, shown in the diagram, for photosynthesis.

_____ (1)

Total 7 marks

- 2 The diagram below shows a vertical section through a piece of apparatus a student used to investigate the conditions woodlice prefer.



- a) Observe the diagram carefully and then state the condition the student was investigating. _____ (1)
- b) State two changes the student could make to the same apparatus, to investigate whether woodlice prefer light or dark conditions. _____ (2)
- c) When the student carried out the investigation stated in 'b', the student found out that woodlice preferred dark conditions. State one way how this helps them to survive. _____ (1)

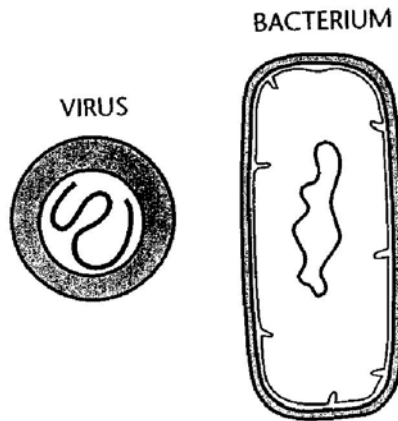
Total 4 marks

- 3 There are beneficial insects as well as harmful ones. Farmers may control harmful insects in the environment, either by using an insecticide or by introducing an organism which feeds on the pest.

- a) How is the second type of pest control, mentioned above, referred to? _____ (1)
- b) Give:
- (i) one advantage and one disadvantage of using insecticides to control harmful insects.
- Advantage _____ (1)
- Disadvantage _____ (1)
- (ii) one disadvantage of introducing a new organism in an environment, to control a pest.
- Disadvantage _____ (1)

Total 4 marks

4 The diagrams below show a virus and a bacterium.



a) State any four differences between viruses and bacteria.

- (i) _____
- (ii) _____
- (iii) _____
- (iv) _____ (4)

b) Viruses are often referred to as being borderline between living and non living. Give two reasons for this.

- (i) _____
- (ii) _____ (2)

c) State the basic difference between bacteria and protists.

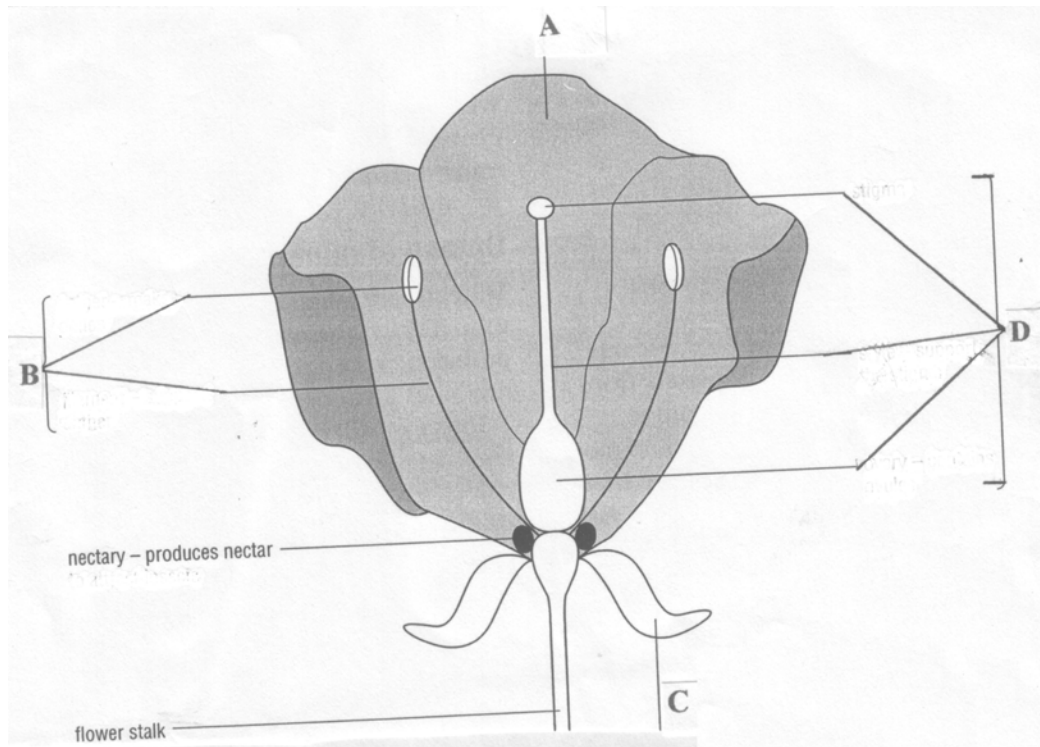
_____ (1)

d) The real length of a bacterium is .002mm. Work out the magnification of the diagram of the bacterium.

_____ (2)

Total 9 marks

- 5 The following diagram shows a longitudinal section through an insect pollinated flower.



a) Label the parts marked:

A _____

B _____

C _____

D _____ (4)

b) State one function of each of the following structures:

A _____

B _____

C _____

D _____ (4)

c) State one characteristic of structure A that helps it to perform its function.

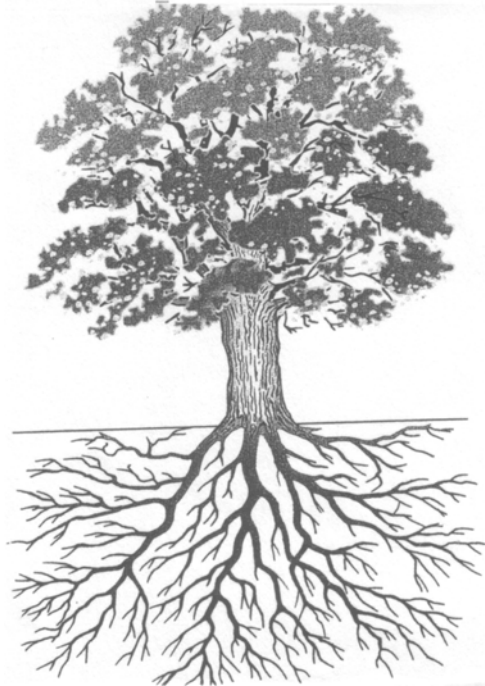
_____ (1)

d) Insect pollinated flowers produce two substances that are beneficial to insects. Name these two substances.

_____ (2)

Total 11 marks

6 The diagram below shows a deciduous tree,(a tree that sheds its leaves in winter)



a) The roots of the tree are well spread. State one advantage to the tree, of having roots spread over a large area.

_____ (1)

b) Give : (i) two functions of roots (ii) one function of stems.

Functions of roots _____
_____ (2)

Function of stems _____ (1)

c) The tree sheds its leaves in winter. Explain briefly why growth almost stops in winter.

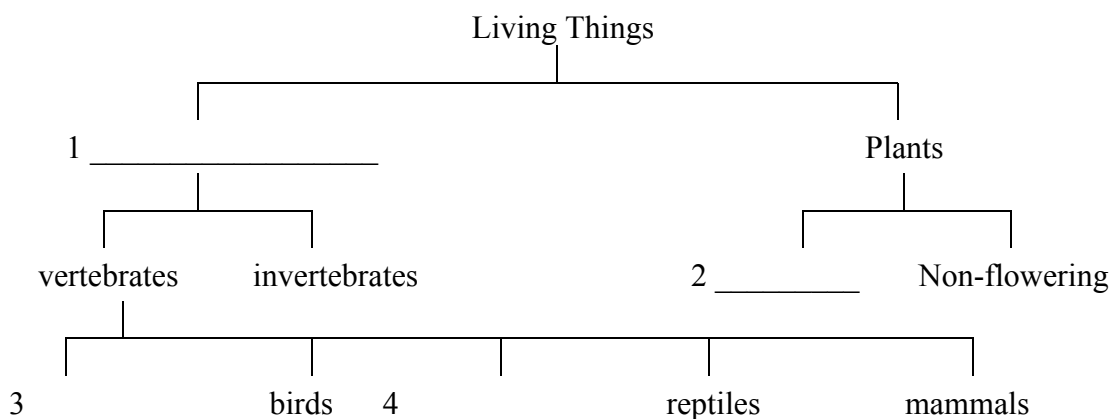
_____ (2)

d) Evergreen trees are adapted to reduce water loss when not enough water is available. State two ways in which such trees may be adapted to reduce water loss.

_____ (2)

Total 8 marks

7 The following is a classification diagram.



a) Fill in the blanks on the diagram. (4)

b) State the main difference between vertebrates and invertebrates.

_____ (1)

c) Give one external characteristic of :

(i) mammals _____ (1)

(ii) Birds _____ (1)

d) Give one example of:

(i) a flowering plant you have studied _____ (1)

(ii) a reptile _____ (1)

e) State the **Kingdom** to which the following organisms belong.

Organism

Kingdom

Mushroom

Amoeba

(2)

f) Choose **a, b, c, or d**, to complete the sentence which follows.

- (a) giving organisms a name
- (b) putting organisms into groups
- (c) identifying organisms
- (d) describing organisms

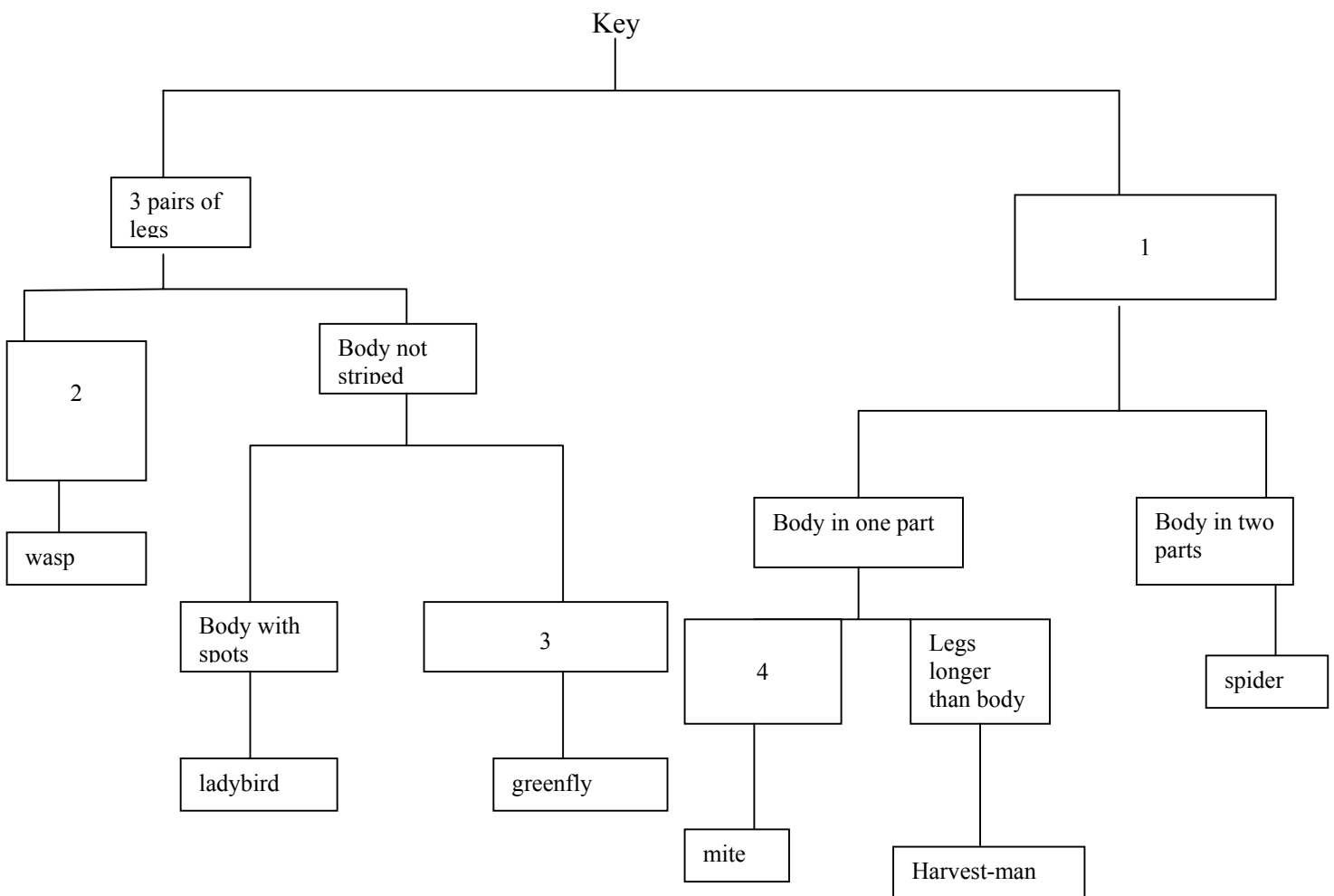
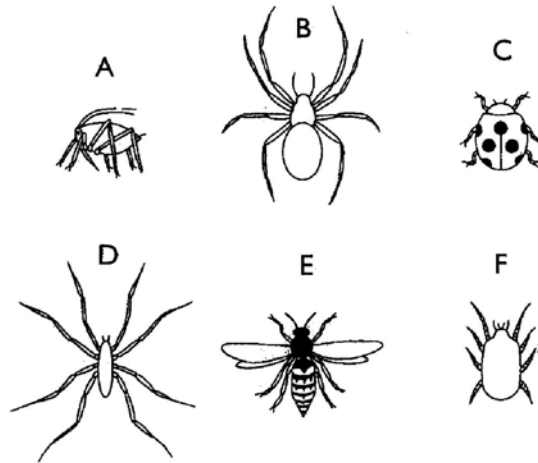
To biologists, classification means _____ (1)

Total 12 marks

SECTION B : This section carries 45 marks.
(Answer on the separate paper provided)

Answer QUESTION ONE and any other TWO questions.

1. Some students investigated an ecosystem, and during this investigation they caught animals A, B, C, D, E, F, shown in the diagram below.
 The second diagram shows an incomplete version of the branched key that the students constructed.



- a) Study the diagrams carefully, then complete the key by filling spaces 1, 2, 3 and 4, shown in the diagram. (4)
- b) Use the key to identify animals A, B, C, D, E, F. (6)
- c) To which class of animals does animal E belong? (1)
- d) Name two features, **visible** in animal E which are **not visible** in any of the other animals. (2)
- e) All the animals shown in the diagram belong to the same group. Give the name of this group. (1)
- f) State one feature which is common to all animals that belong to the group of animals named in 'e'. (1)

2. Plant shoots are positively phototropic and negatively geotropic.

- a) Explain what is meant by
- (i) **positively phototropic** (ii) **negatively geotropic.** (4)
- b)(i) Describe an experiment, including a control, to show **EITHER** that shoots are positively phototropic **OR** that shoots are negatively geotropic. (6)
- (ii) Explain briefly how one can make sure that the result obtained in '(b) (i)' is reliable. (2)
- c) Large trees have a tap root system.
- (i) Draw a labelled diagram to show the structure of a tap root system. (2)
- (ii) Give one reason why a tap root system is advantageous to large trees. (1)

- 3a) Draw a diagram to show the structure of amoeba. Label the nucleus, cell membrane, pseudopodia and cytoplasm. (4)
- b) List four characteristics which amoeba shares with all other living organisms. (2)
- c) Explain the importance of a contractile vacuole in fresh water protists. (4)
- d) A student observed that when amoeba is in dilute sea water, its contractile vacuole contracts at a slower rate than when it is in fresh water. Give a simple explanation for this observation. (3)
- e) Amoeba has no specialised breathing organs. State how exchange of gases takes place in this organism. (2)

4 a) Explain the difference between the following modes of nutrition;

(i) Holozoic (ii) holophytic (iii) saprophytic (iv) parasitic (8)

b) (i) Draw and label a diagram to show the structure of a named saprophytic fungus you have studied, as it would be seen under the low power of the light microscope. (3)

(ii) Describe how the fungus named in (b)(i) obtains its food. (4)

5 Give a biological explanation for each of the following statements.

a) Soil rich in earthworms yields better crops. (4)

b) Roots of seedlings growing in normal conditions always grow downwards while those growing on a rotating clinostat remain horizontal. (4)

c) Plants grow better in loam than in sandy soil, both in Summer and in Winter. (4)

d) Applying liquid artificial fertilizers in a concentrated form may result in death of plants. (3)