JUNIOR LYCEUM ANNUAL EXAMINATIONS

Educational Assessment Unit - Education Division

2002

FORM 3 **BIOLOGY** **TIME 1½ Hour**

Comment:

Name:_____ Class: _____

SECTION A: This section carries 55 marks.

ANSWER ALL QUESTIONS IN THE SPACES PROVIDED.

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1. This exercise is about **cell structures.**
Match a number in Column A with a letter in Column B.
The first is done for you.

A	B
1. Cell wall	**a.** releases energy during aerobic respiration.
2. Vacuole	**b.** controls the passage of substances into and out of cell.
3. Mitochondria	**c.** contains cell sap in plant cells.
4. Nucleus	**d.** made of cellulose and supports plant cell.
5. Cell membrane	**e.** contains chlorophyll to trap light energy
6. Chloroplast	**f.**. contains genetic material and controls the activities of the cell.

ANSWERS:

1. d	**2.**	**3.**	**4.**	**5.**	**6.**

(total 5 marks)

2. State if the following statements about classification are true or false.

a. A Jellyfish is classified as a vertebrate. _____ (1)

b. Annelids are worms that have a long segmented body and a digestive tract with a mouth and anus. _____ (1)

c. A tortoise is an amphibian and it lays eggs on land. _____ (1)

d. Conifers reproduce by seeds that are formed in cones. _____ (1)

e. A bacterium is an example of a prokaryotic cell. _____ (1)

(total 5 marks)

3. This question is about the **STEM .**

a. List <u>two</u> (2) functions of the **stem**.

(i) _____

(ii) _____ (2)

b. In the space provided draw a simple diagram of a dicot stem to show the position of the vascular bundles. Label the xylem and phloem. (4)

(total 6 marks)

4. a What is transpiration?

_____

_____ (2)

b. Name two (2) external (environmental conditions) that affect the rate of transpiration.

(i) _____ (1)

(ii) _____ (1)

c. Name two (2) features that help plants reduce water loss?

(i) _____ (1)

(ii) _____ (1)

d. Name the instrument used to measure the rate of transpiration.

_____ (1)

(total 7 marks)

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5. The diagram below shows the adult form of an animal.

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a. To which **class** does this animal belong? _____ (1)

b. Name the **phylum** which includes the class mentioned in question (a) :

_____ (1)

c. Name the **three** other classes that are also included in the same phylum.

(i) _____ ; (ii) _____; (iii) _____ (3)

d. State **three** features visible on the diagram which helped you decide on your answer to question (a):

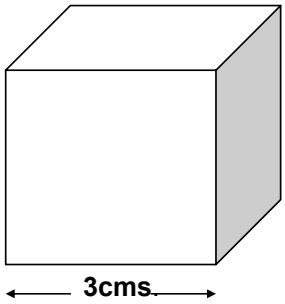
(i) _____

(ii) _____

(iii) _____ (3)

(total 8 marks)

6.



a. Work out the surface area to volume ratio of the cube with sides **3 cms.**

(i) Surface Area = _____

_____(2)

(ii) Volume = _____

_____(2)

Surface Area to Volume ratio = _____(1)

b. If the size of the cube is decreased, would the surface area to volume ratio **increase or decrease**? _____ (1)

(total 6 marks)

7. A germinating bean seedling with a straight plumule (shoot to be) and radicle (root to be) was pinned to a vertically-held cork sheet. The plumule and radicle were horizontal, as shown in the diagram below, and kept in a humid atmosphere.

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Plumule  Radicle

BEFORE **AFTER A FEW DAYS**

a. Draw, in the space provided above, the seedling after a few days. (2)

b. In this example, both the shoot and the root change direction of growth in response to **GRAVITY**. This response is known as _____ _____ in shoot and _____ _____ in root.(2,2)

c. List **two** (2) functions of **roots**.

(i) _____

(ii) _____(2)

(total 8 marks)

8. a. What type of soil is '**LOAM**'?

_____ (1)

b. Complete the checklist on **Sandy and Clay Soil**. The first is done for you. (3)

	Low water content	Heavy	Rapid drainage	High air content
CLAY				
SANDY	✕			

(total 4 marks)

9. Define:

a. **OSMOSIS**: _____

_____ (2)

b. **DIFFUSION:** _____

_____ (2)

c. **ACTIVE TRANSPORT:** _____

_____ (2)

(total 6 marks)

SECTION B : Answer your questions on the papers provided.
This Section carries 45 marks.
<u>Answer Question ONE and any other TWO questions</u> .

Question 1. Read the following paragraph and answer the questions below:

The Greek philosopher Aristotle was the first person to make a real attempt to classify living organisms. It was not until 2000 years later that John Ray developed a natural classification system, which was later improved upon by *Linnaeus*. Linnaeus devised the binomial system for *naming organisms that avoided much confusion.*

A scheme now favoured by many biologists is the scheme comprising the Virus, Bacteria, Protist, Fungus, Plant and Animal Kingdoms. Viruses are often described *'as being borderline between living and non-living '.* Bacteria vary in size but are all single cells. Fungi share some of the properties of plants but they cannot make their own food.

a. How does the naming system devised by Linnaeus '*avoid much confusion"*? (3)

b. i. Draw a large labelled diagram to show the outline structure of a typical virus. (3)

ii. Explain why viruses are often described 'as being borderline between living and non- living'. (2)

c. State *one* similarity and one difference between 'viruses' and 'bacteria'. (1,1)

d. i. Draw a clear well-labelled diagram of a unicellular fungus **or** a **filamentous** fungus. (4)

ii. Name one characteristic that fungi share with plants? (1)

(total 15 marks)

2. a. Draw a large labelled diagram to show the structure of a **named** common insect – pollinated flower. (5)

b. State **one** (1) function of each of any **three** parts labelled in question (2a). (3)

c. State **one** (1) function of the leaf in flowering plants. (1)

d.Draw a labelled diagram to show the **external** structure of a typical dicot leaf.(3)

e. Draw a table to illustrate **three** (3) differences between monocotyledonous and dicotyledonous plants. (3)

(total 15 marks)

3. a. Describe briefly the following terms:

(i) parasitism (ii) symbiosis (2,2)

b. For **each** of the terms mentioned in question (3a) give **one** example. (1.1)

c. Describe the term **'biological control'**. In your answer give **two** (2) advantages of using 'biological control' to ' chemical control'. (2.2)

d. Describe, using diagram/s, the saprophytic mode of nutrition (extra- cellular digestion) of a named fungus or bacterium. (5)

(total 15 marks)

4. a. State **two** (2) differences between a unicellular animal-like and a unicellular plant-like protist. (2)

b. Draw a labelled diagram to show the outline structure of a named animal-like protist. (4)

c. Describe, using diagrams, **osmoregulation** in a named animal-like protist.(4)

d. Describe an experiment to show the principles of '**osmosis'**. (5)

(total 15 marks)

5. a. Write short notes to illustrate the characteristics of the following:

(i) bryophytes; (ii) ferns. (3, 3)

b. Describe how **earthworms** can have a beneficial effect on soil. (4)

c. Describe an experiment to find out the percentage of **humus** in soil. (5)

(total 15 marks)