JUNIOR LYCEUM ANNUAL EXAMINATIONS 2005
EDUCATIONAL ASSESSMENT UNIT – EDUCATION DIVISION

BIOLOGY- FORM III
TIME: 1H 30 MIN

NAME: _____ CLASS: _____

Question No.	**Section A**							**Section B**					
	1	**2**	**3**	**4**	**5**	**6**	**7**	**1**	**2**	**3**	**4**	**5**	
Max mark	10	8	7	7	6	9	8	15	15	15	15	15	
Actual mark													**THEORY TOTAL**

85% Theory Paper	**15% Practical**	**100% Final Score**

Section A
Answer all questions in this section.
This section carries 55 marks.

1a. Write the correct biological term for the process described by **each** of the following statements:

(i) the breakdown of food to release energy _____

(ii) a lion tearing and biting the flesh of a zebra that it has caught _____

(iii) getting rid of excess water by means of a contractile vacuole _____

(iv) the generation of new individuals _____

(v) the change of a larva into a butterfly _____

(5 marks)

b. Name the part of the cell that corresponds to **each** of the following descriptions:

(i) is composed of cellulose _____

(ii) regulates entry and exit of materials into and out of the cell _____

(iii) controls all the cell's activities _____

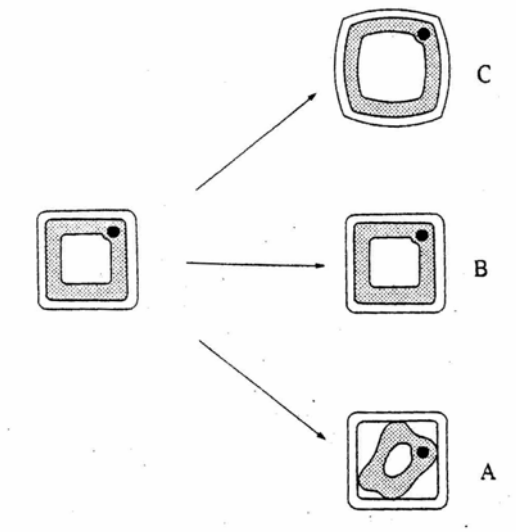
(iv) contains cell sap _____

(v) the site where all the cell's chemical reactions take place _____

(5 marks)

(Total 10 marks)

2. The following diagram shows three plant cells which have been placed in different solutions.



a. Write the letter of the plant cell that:

(i) has been placed in distilled water _____

(ii) has been placed in a concentrated salt solution _____

(iii) has been placed in a solution with the same concentration as the cell contents _____

(iv) is turgid _____

(v) is plasmolysed _____ (5 marks)

b. What would happen to a plant if many of its cells are plasmolysed?

_____ (1 mark)

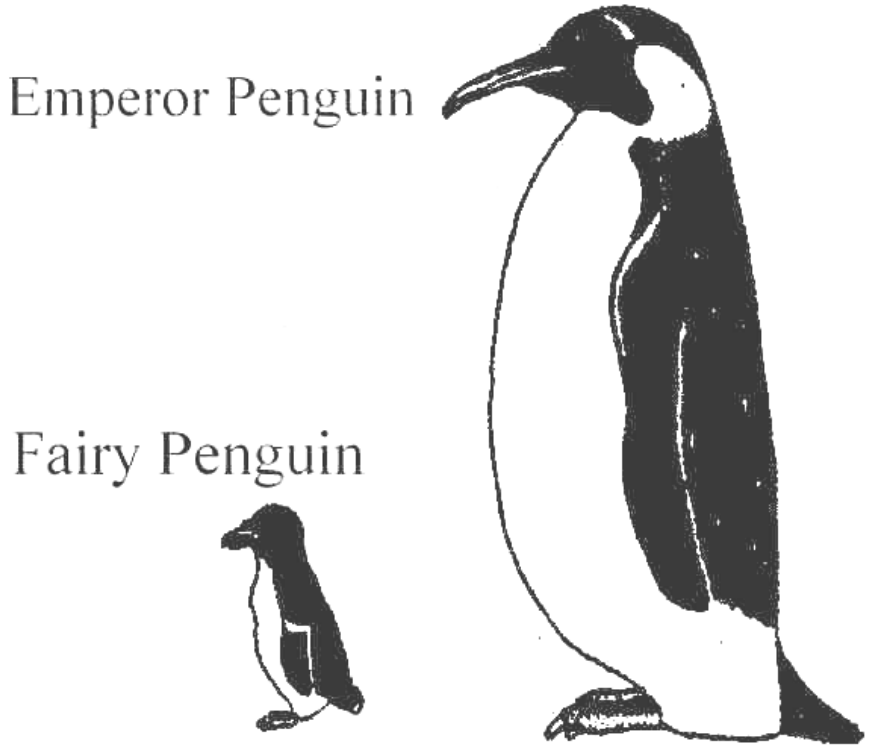
c. Explain why plant cells do not burst when placed in distilled water.

_____

_____ (2 marks)

(Total 8 marks)

3. The following diagram shows two penguins of different size.



a. Which penguin shown above will:

(i) have a large surface area to volume ratio? _____

(ii) live in a cold region like Antartica? _____

(2 marks)

b. In which class of vertebrates are penguins classified?

_____ (1 mark)

c. Write **TWO** structural features of the class you mention in 'b' and for **each** give its importance.

_____

_____

_____

_____ (2, 2 marks)

(Total 7 marks)

4. A biology student had a number of difficulties when using the light microscope.

a. Use arrows to match the correct possible solution to **each** difficulty listed in the Table below.

Difficulty	**Possible Solution**
Specimen cannot be found	Polish eyepiece lens and/or objective lens with lens tissue
Image is very dark	Check that specimen is in centre of hole to stage
Image is half light and half dark	Remove coverslip and remount by lowering it more slowly onto specimen
Image is blurred	Adjust mirror to improve lighting
Many dark circles (air bubbles) are present	Rotate nosepiece to click objective into place

(5 marks)

b. Explain how you would increase the magnifying power of the light microscope.

_____

_____ (2 marks)

(Total 7 marks)

5a. What is the shape of the following bacteria?

(i) *Streptococcus* _____

(ii) *Bacillus megaterium* _____

(2 marks)

b. Bacteria are tiny single celled organisms. What is the unit used to measure the size of bacteria?

_____ (1 mark)

c. Some bacteria are autotrophic bacteria.

(i) Define the term autotrophic.

_____ (1 mark)

(ii) Name the important component present in the cell of autotrophic bacteria.

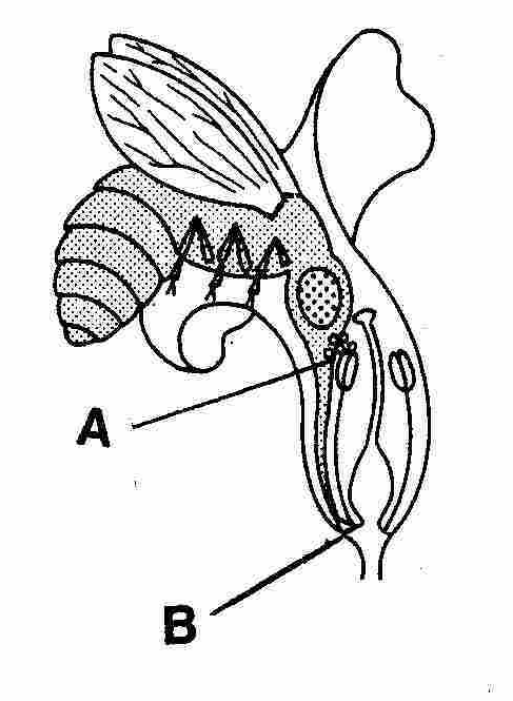
_____ (1 mark)

d. Explain the importance of the slimy capsule present in some bacteria.

_____ (1 mark)

(Total 6 marks)

6. The following diagram shows an organism visiting a flowering plant.



a. Write **TWO** features visible in the diagram that enable you to decide that the organism visiting the flowering is an insect.

_____

_____ (2 marks)

b. What is the insect taking up in the part of the diagram:

(i) labelled A? _____

(ii) labelled B? _____ (2 marks)

c. A biology student thought that the flowering plant shown in the diagram is a dicotyledon plant (dicot).

(i) Explain the term dicotyledon plant.

_____

_____ (2 marks)

(ii) Give **ONE** example of a dicotyledon plant.

_____ (1 mark)

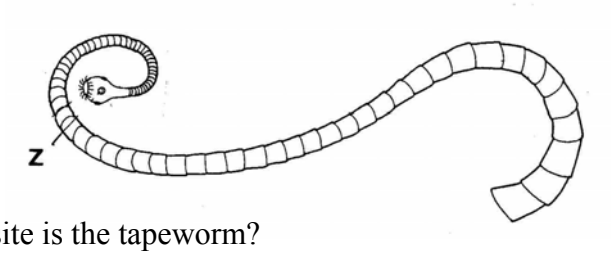
(iii) State **TWO** features of the plant that the biology student can check out to confirm that it is a dicotyledon plant.

_____

_____ (2 marks)

(Total 9 marks)

7. A human being was infected with the parasitic Tapeworm. The following diagram shows the Tapeworm.



a. What type of parasite is the tapeworm?

_____ (1 mark)

b. (i) How could the human being become infected with the tapeworm?

_____ (1 mark)

(ii) Where would the adult tapeworm live in a human being?

_____ (1 mark)

c. Explain why in the tapeworm there is a loss of sense organs.

_____ (1 mark)

d. What happens to a human being infected with a tapeworm?

_____

_____ (2 marks)

e. The person infected with the tapeworm was given treatment to cut off the tapeworm at point Z. Will this treatment be effective or not? Give a reason for your answer.

_____

_____ (2 marks)

(Total 8 marks)

Section B
Answer question 1 and any **TWO** others from this section.
This section carries 45 marks.

1. Read the following passage and then answer the questions.

   Substances need to be transported for long distances throughout all plants' organs. Sugars for example, are produced in photosynthesising cells of the leaves and may need to be transported to storage cells in roots. The water and mineral ions absorbed from the soil may be required by cells at the growing tip of the shoot. These long distance transport functions are carried out by two specialised plant tissues.

a. Name:
   (i) the photosynthesising cells of the leaves
   (ii) the cells absorbing water from the soil. (2 marks)

b. How is **each** cell mentioned in 'a' structurally adapted for its function? (1, 2 marks)

c. Name the **TWO** specialised plant tissues used for long-distance transport of
   (i) water
   (ii) sugar (2 marks)

d. Compare the direction of transport of sugars in a plant in spring and in summer. (2 marks)

e. Some water that reaches the leaf evaporates through tiny pores present in the leaf surface.
   (i) Name the process by which water is lost from the leaf surface. (1 mark)

   (ii) Name the pore in the leaf surface through which water diffuses out. (1 mark)

   (iii) Explain how the process you name in e (i) is affected by high temperatures. (2 marks)

f. Mineral ions are taken up from the soil by active transport. Give **ONE** difference between active transport and diffusion. (2 marks)

(Total 15 marks)

2. Give a biological explanation for **each** of the following statements.

a. In a system of crop-rotation a leguminous plant such as peas is very important. (3 marks)

b. Air is an important part of any type of soil. (3 marks)

c. Topsoil is usually darker that the subsoil. (2 marks)

d. Farmers remove weeds from the fields where crops are grown. (3 marks)

e. Leaching affects soil fertility. (2 marks)

f. Small burrowing mammals like moles can be beneficial to the soil they live in. (2 marks)

(Total 15 marks)

3a. The Euglena is a unicellular organism that moves towards light.
(i) Suggest why the Euglena moves towards light. (1 mark)
(ii) Name **ONE** feature that enables the Euglena to detect light. (1 mark)
(iii) What does the Euglena use to move around? (1 mark)

b. Plant shoots bend towards light.
(i) Give the term that describes the bending of a plant shoot towards light. (1 mark)
(ii) Give **ONE** advantage of the plant shoot bending towards light. (1 mark)
(iii) Describe an experiment to demonstrate that a plant shoot bends towards light. (5 marks)
(iii) Give **ONE** difference between the movement of the Euglena towards light and the movement of the shoot towards light. (2 marks)

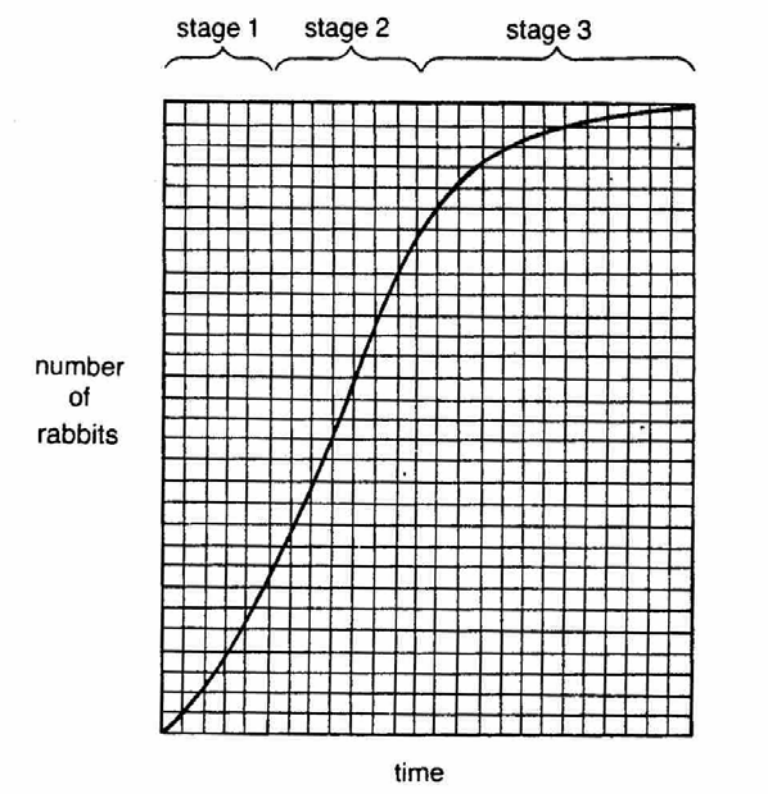
c. A gardener cuts off the apical bud of a plant as shown in the diagram below.

Draw a diagram to show how the plant grows once the apical bud has been removed. Give a reason for the type of growth shown in your diagram.

(3 marks)

(Total 15 marks)

4. The following graph shows how a population of rabbits may grow.



a. Describe the growth of the population taking place in:
   (i) Stage 1
   (ii) Stage 2
   (iii) Stage 3 (6 marks)

b. Rabbits are pests of agriculture. Myxomatosis is a fatal disease of rabbits caused by a virus. The myxomatosis virus was introduced among rabbits' population (at Stage 3) to reduce their number.
   (i) Write the term that describes this method of reducing pests and give **ONE** advantage and **ONE** disadvantage of the method you mention.
   (ii) Describe **TWO** problems that may arise if a population of rabbits keeps growing uncontrollably?

   (3, 2 marks)

c. (i) Draw a labelled diagram to show the structure of a typical virus. (3 marks)
   (ii) What do viruses need in order to reproduce? (1 mark)

(Total 15 marks)

5. The Painted Frog called *Discoglossus pictus* is well adapted to live in the Maltese environment.

a. Name the class to which the frog belongs and write **TWO** other organisms you would find in the class you mention. (3 marks)

b. Write (i) the species name
(ii) the genus name
for the painted frog. (2 marks)

c. Frogs are ectothermic while mammals are endothermic. Distinguish between the terms ectothermic and endothermic. (2 marks)

d. Explain why frogs have webbed hind legs that are much longer than the forelegs. (2 marks)

e. In a frog water evaporates readily from the thin moist skin. Suggest **ONE** adaptation of the frog to overcome this problem. (2 marks)

f. (i) Give **ONE** external structural difference between tadpoles and adult frogs. (2 marks)
(ii) Name the gas exchange organ in tadpoles and that in adult frogs. (2 marks)

(Total 15 marks)