

JUNIOR LYCEUM ANNUAL EXAMINATIONS 2008
 DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
 Educational Assessment Unit

BIOLOGY – FORM III
 TIME: 1h 30min

NAME: _____ CLASS: _____

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

85% Theory Paper	15% Practical	100% Final Score

Section A

Answer all questions in this Section.

This Section carries 55 marks.

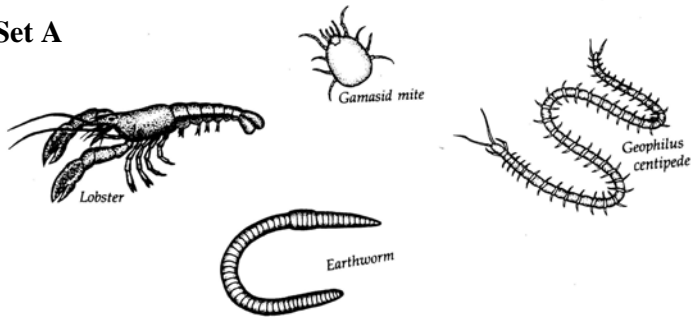
1. Name the substance that fits **each** of the following descriptions:

a.	The sugary solution found at the base of the flower	
b.	The genetic material found in chromosomes within the nucleus	
c.	The green pigment found in chloroplasts	
d.	The liquid found in the contractile vacuoles of a protist such as the Amoeba	
e.	The secretion produced in the sebaceous gland of the skin	

(1, 1, 1, 1, 1 mark)
Total 5 marks

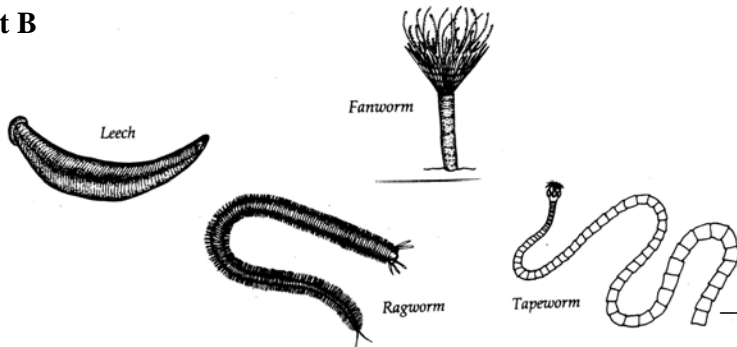
2. Look at the following sets of organisms and for **each** set circle the organism that is the odd one out and write the phylum to which the organism you circle belongs.

Set A

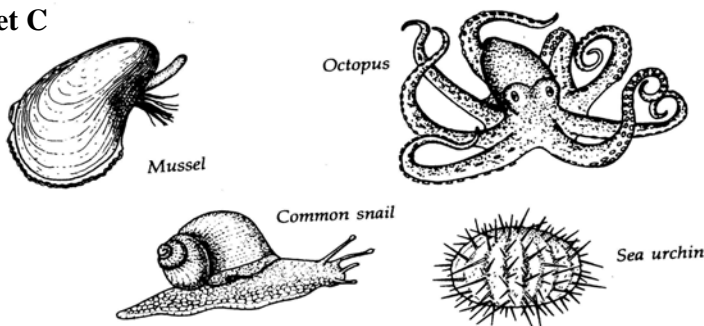


Name of Phylum

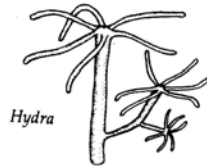
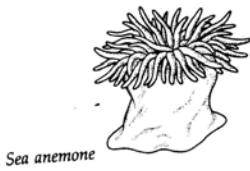
Set B



Set C



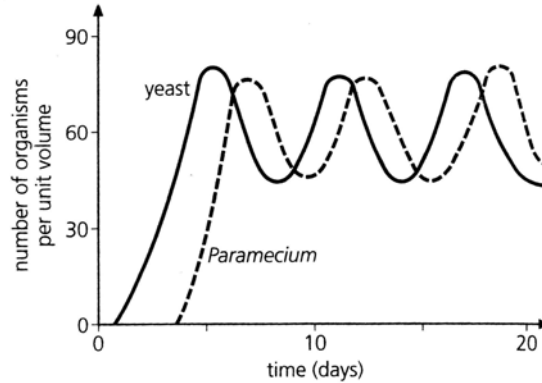
Set D



(4, 4 marks)

Total 8 marks

3. The following graph shows what happens when some Paramecium (single-celled organisms) are added to a population of yeast.



- a. (i) Name the phylum to which single celled organisms such as the Paramecium belong.

- (ii) What happens to the yeast population after the Paramecium are added? Explain why this happens.

(1, 2 marks)

- b. Suggest why the number of Paramecium go down soon afterwards they reach a peak in their population

_____ (1 mark)

- c. If the Paramecium were all taken away what would happen to the yeast population:

- (i) soon after

- (ii) after some time?

_____ (1, 1 mark)

- d. Give ONE other example of a predator-prey relationship.

(2 marks)

Total 8 marks

4. The following diagram shows a marathon runner.
- a. (i) List TWO ways in which the marathon runner's body is responding to the increase in body temperature.



- (ii) Explain how each change you mention in a 'i' helps to control body temperature.

(2, 2 marks)

- b. List TWO vital functions that the marathon runner goes through during the marathon.

(2 marks)

Total 6 marks

- 5a. Name TWO structures that give support to a plant cell.

(2 marks)

- b. Why are there different types of cells?

(1 mark)

- c. (i) Explain why no chloroplasts are found in a root cell.

- (ii) In the space below draw a root hair cell.

- (iii) How are mineral ions absorbed when they are at a lower concentration in the soil than in the root hair cell?

(1, 3, 1 marks)

Total 8 marks

6. A plant shoot includes several organs. These are the stem and its branches, the leaves, flowers and buds. In plants such as the tomato, some flowers develop into organs called fruits while new flowers are still opening from buds.

- a. Name TWO organs found in a human being.

(2 marks)

- b. Name the part that:
- (i) protects the flower when still in bud _____
 - (ii) develops into the fruit _____
 - (iii) is enclosed inside the fruit. _____ (1, 1, 1 mark)

c. The stem holds the leaves high up in the air. List TWO advantages of this.

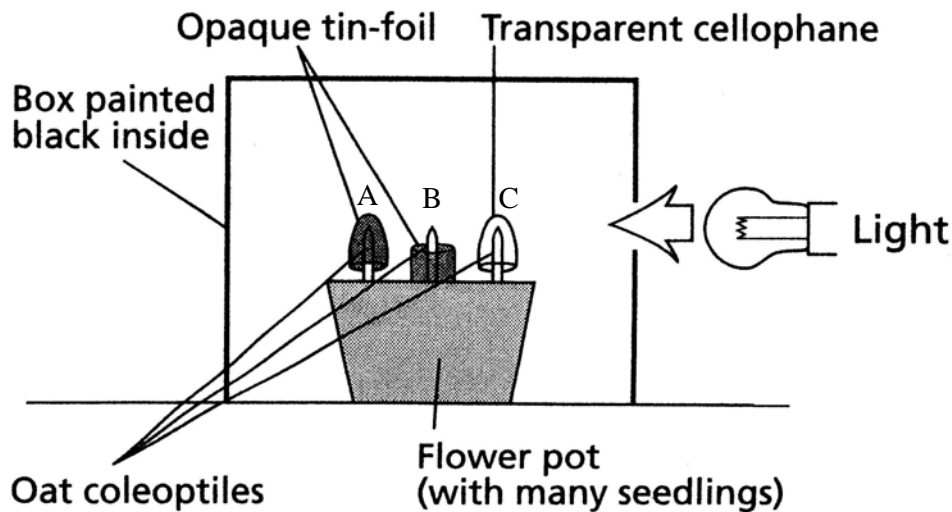
_____ (2 marks)

d. Flowers are important to a plant. Explain.

_____ (2 marks)

Total 9 marks

7. A biology teacher has set up an experiment to investigate the effect of light from one side in oat coleoptiles.



- a. Describe what happens to the:
- (i) oat coleoptile (marked A) that is covered completely with opaque tin foil after two days.
 - (ii) oat coleoptile (marked C) that is covered with transparent cellophane after two days.
- _____
- _____ (1, 1 mark)

b. A biology student predicted that the oat coleoptile whose tip is left uncovered (marked B) will still bend towards the light source. State whether you agree with the student's prediction and give a reason for your answer.

_____ (2 marks)

c. Write the correct term to explain:

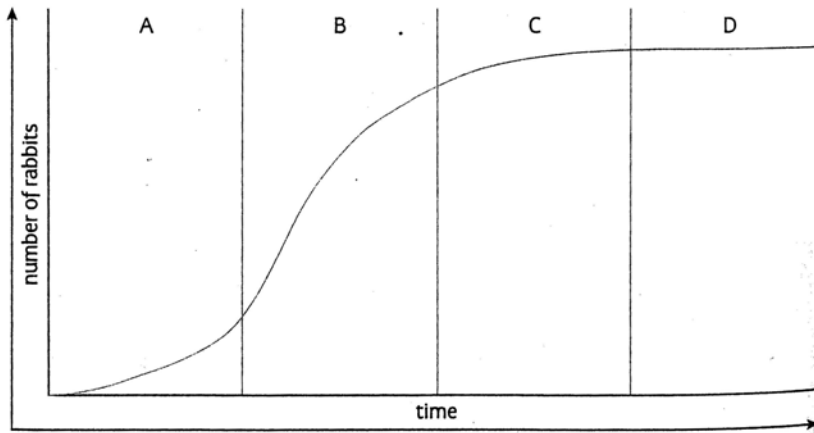
(i) the growth of plant organs towards light

(ii) the growth of plant organs away from the pull of gravity.

(1, 1 mark)

Total 6 marks

8. The following graph shows the growth of a population of rabbits.



a. Write the letter to show the stage at which:

(i) the population growth is very fast

(ii) the size of the population remains the same

(iii) the population grows very slowly because there are only few fertile individuals.

(1, 1, 1 mark)

b. Explain why animal populations grow quickly when they move to a new area.

(2 marks)

Total 5 marks

Section B

Answer question 1 in this section and choose any TWO others.

This section carries 45 marks.

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

The Red Palm Weevil – another alien species

The Red Palm Weevil – il-Bumunqar Aħmar tal-Palm – is a relatively large species of beetle about 3cm long. Scientifically known as *Rhynchophorus ferrugineus* the Red Weevil originates from tropical Asia, but has now spread to Africa and Europe. The rapid spread of this pest is due to the transportation of infested young or adult date palm trees. The Red Weevil carries out complete metamorphosis and it spends all its stages inside the palm tree itself.



Red Palm Weevil.

- a. Define the term pest. (1 mark)
- b. (i) Write the phylum and the class to which the Red Palm Weevil belongs.
(ii) List TWO structural characteristics of the class you name in b'i'. (2, 2 marks)
- c. Name the correct sequence of the FOUR stages which the Red Palm Weevil undergoes in metamorphosis. (2 marks)
- d. Suggest TWO ways how pests can be removed. (2 marks)
- e. It is predicted that the population of the Red Palm Weevil in the local environment will increase.
(i) Define the term population.
(ii) Suggest ONE reason why the population of this pest is expected to increase.
(iii) Suggest ONE way to prevent the further spread of this pest locally. (1, 1, 1 mark)
- f. Malta has indigenous (local) species of palm trees such as the Dwarf European Fan Palm, *Chamaerops humilis*, the Date Palm, *Phoenix dactylifera*, and the Canary Island Palm, *Phoenix canariensis*. Which TWO types of local Palm trees (from the ones listed) are most closely related? Give a reason for your answer. (3 marks)

Total 15 marks

- 2a. The boxes below give the stages of reproduction in flowering plants.

Germination	Pollination	Dispersal	Fertilisation
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Write down the words in the boxes in the correct order, to show the sequence of events of reproduction in a flowering plant. (2 marks)

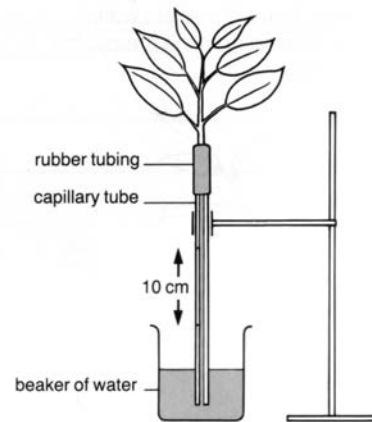
- b. Explain why **each** step listed in 'a' is important. (4 marks)
- c. List three conditions necessary for germination. (3 marks)

- d. A biology student used a light microscope to observe some pollen grains taken from different flowers. The student observed some pollen grains were small and very smooth while other were larger with spiky sticky surface.
- Explain the difference in structure of the two types of pollen grains.
 - Draw a labelled diagram of the structure where pollen is produced. (2, 2 marks)
- e. Explain how the student uses the light microscope to observe the pollen grains **in detail**. (2 marks)

Total 15 marks

3. The rate of transpiration in plants can be measured using the following apparatus. The plant draws up the water it needs through a very narrow tube. An air bubble in the tube moves as the water is absorbed. By measuring how far the air bubble in the tube moves each minute, a biology student compared the rate of transpiration under the three conditions listed below:

- On a bench in the laboratory at room temperature.
- In the laboratory with a fan blowing over the plant.
- In a warm incubator.



- Name the apparatus used by the biology student.
 - What should the biology student do in order to check that the results are reliable?

(1, 2 marks)

- What conclusions can you draw about the effect of different conditions on the rate of transpiration? (2 marks)
- Predict what is the effect on the rate of transpiration if a hair drier set to warm is used instead of a fan. (3 marks)
- Define the term transpiration and explain why transpiration is both useful and a nuisance to plants.
 - Name the pores through which transpiration takes place and explain how these pores open and close.
 - Explain why a cactus plant living in a dry desert environment has a slow transpiration rate. (3, 3, 1 mark)

Total 15 marks

4. Explain the effect of **each** of the following on soil:

- ploughing
- nitrogen-fixing bacteria
- the presence of earthworms
- monoculture
- adding humus.

(2, 2, 4, 3, 4 marks)

Total 15 marks

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

- a. The roe deer lives in woodlands in Europe and Asia. In spring and summer when the weather is warm, it has a coat of short hair, but in autumn and winter it grows longer hair.
- b. The male of most types of bird has bright colourful feathers.
- c. Fish have a streamlined body.
- d. Ducks do not get wet after swimming in a pond.
- e. Tapeworms live inside the intestines of vertebrates including humans.
- f. Some bacteria have a slimy capsule.

(4, 2, 2, 3, 2, 2 marks)

Total 15 marks