

SECONDARY SCHOOL ANNUAL EXAMINATIONS 2009

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	9	6	7	7	7	6	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.

1. Write the term that best fits **each** of the following statements:

a. a tough flexible carbohydrate material which forms the cell wall around plant cells

b. the thread-like parts of mould _____

c. an air filled structure found in most fish _____

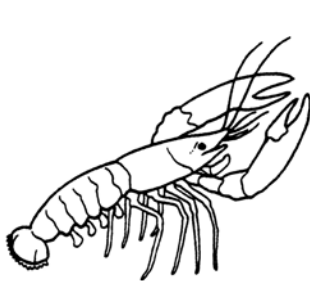
d. swellings on the roots of leguminous plants _____

e. the whip-like structure that propels a bacterium cell _____

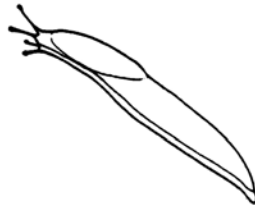
(1, 1, 1, 1, 1 mark)

Total 5 marks

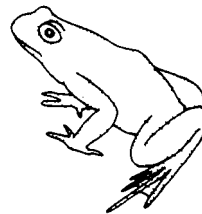
2. Look at the following diagrams and write the names of the organisms in the correct group below.



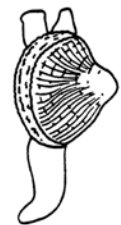
lobster



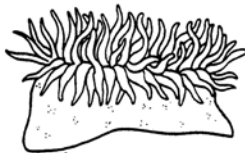
slug



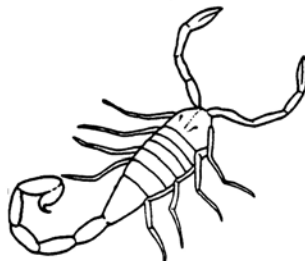
frog



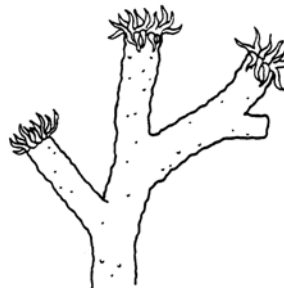
cockle



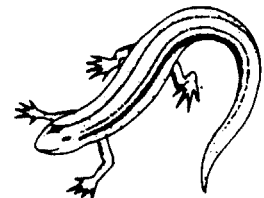
sea anemone



scorpion



coral



green lizard

Chordates

Molluscs

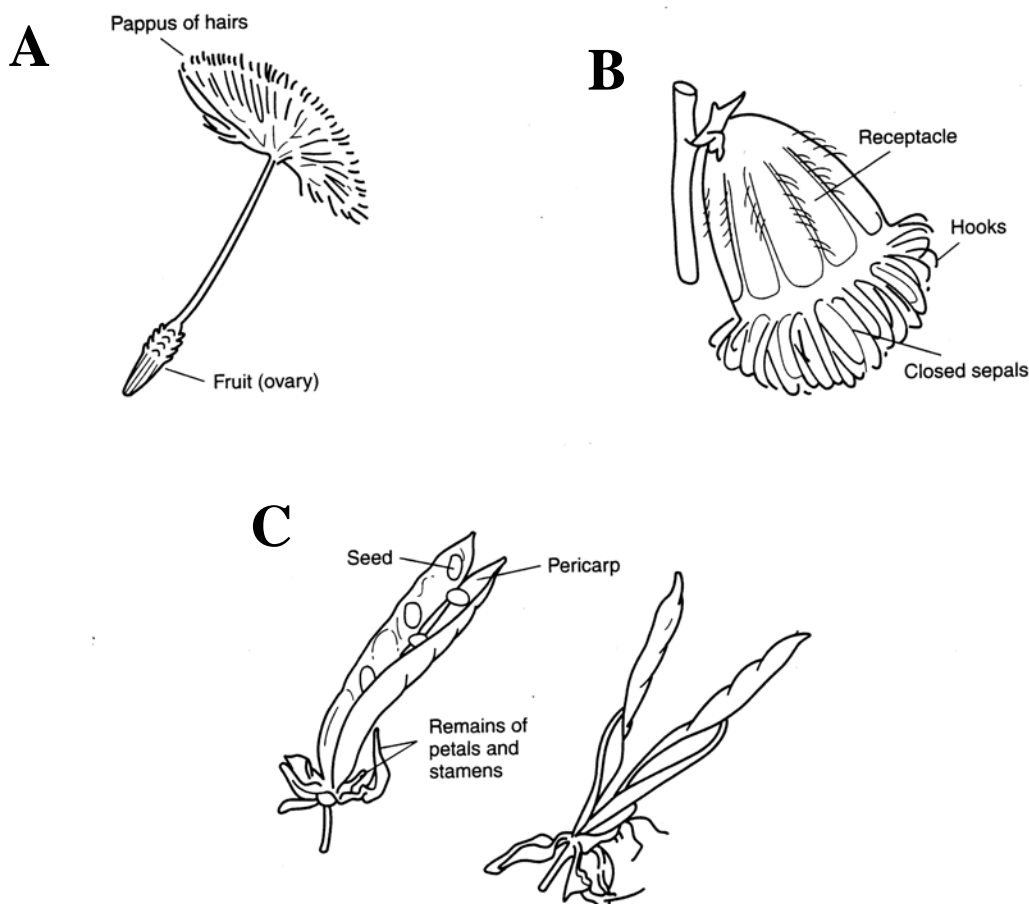
Arthropods

Coelenterates

(2, 2, 2, 2 marks)

Total 8 marks

- 3a. The following diagram shows three (**A**, **B** and **C**) different types of seeds.
Observe the diagrams and in the table below list:
- the method of seed dispersal
 - ONE adaptation of the seed that helps in its dispersal.



Seed	Type of Dispersal	One Adaptation
A		
B		
C		

(3, 3 marks)

- b. Distinguish between epigeal and hypogeal germination.

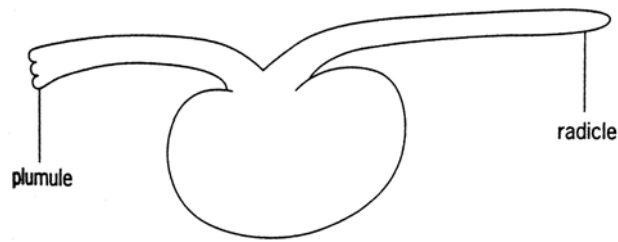
_____ (2 marks)

- c. Write the term that describes a plant containing seeds with one cotyledon.

_____ (1 mark)

Total 9 marks

4. A young broad bean seedling was placed horizontally and given conditions for uniform light intensity.



- a. In the space below draw a diagram to show how you would expect the broad bean seedling to look 3 days after.

(2 marks)

- b. What name is given to the response shown by:

(i) the radicle _____

(ii) the plumule. _____

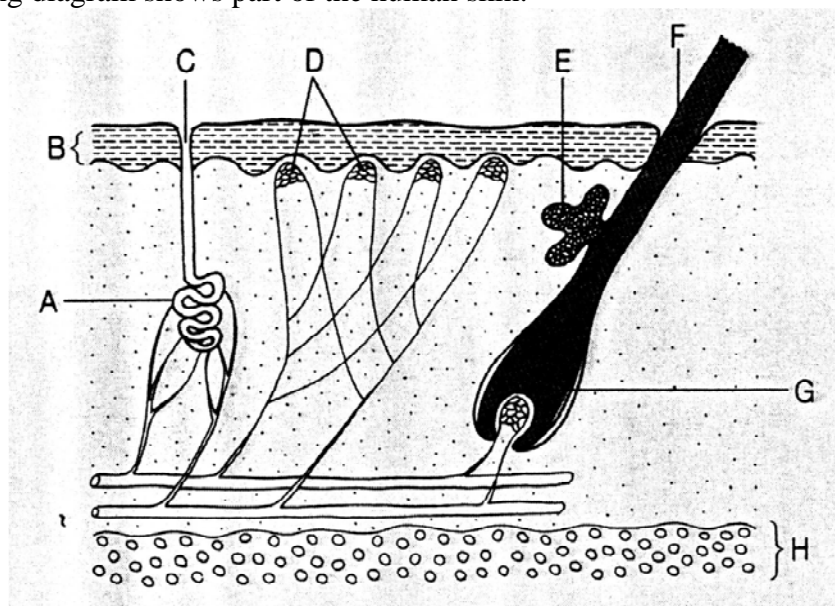
(1, 1 mark)

- c. A biology student noticed the stem of an ivy plant growing out of a room from a tiny gap under the door. Explain.

_____ (2 marks)

Total 6 marks

- 5a. The following diagram shows part of the human skin.



Write the letter of the:

- (i) sebaceous gland _____
 (ii) epidermis _____
 (iii) sweat gland _____

(1, 1, 1 marks)

- b. List ONE change that takes place in the part labelled **D** when the person is waiting outside on a cold morning.

 _____ (2 marks)

- c. Write the letter of the part you would expect to be thicker in wild animals living in a cold region like the Arctic. Give a reason for your answer.

 _____ (2 marks)

Total 7 marks

6. Two main types of soil include sandy soil and clay soil.

- a. In the following table write the type of soil that best fits **each** description.

Description	Type of Soil
• Soil is loose, light and easy to dig	
• Soil holds on to water and nutrients very well	
• Lime is often added to this type of soil	
• Soil contains plenty of air	

(1, 1, 1, 1 mark)

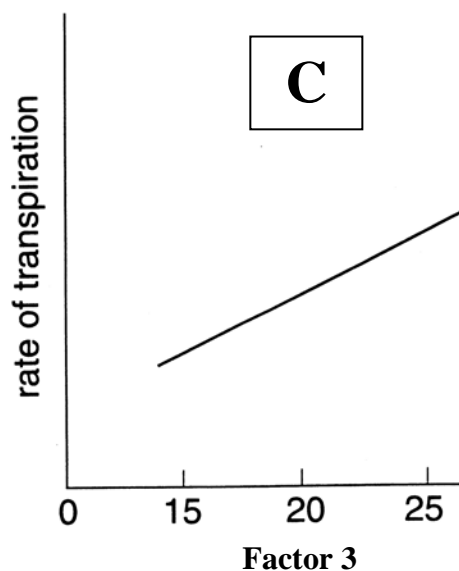
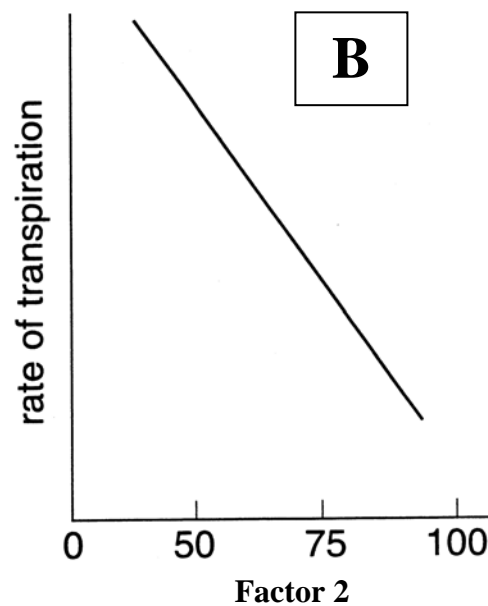
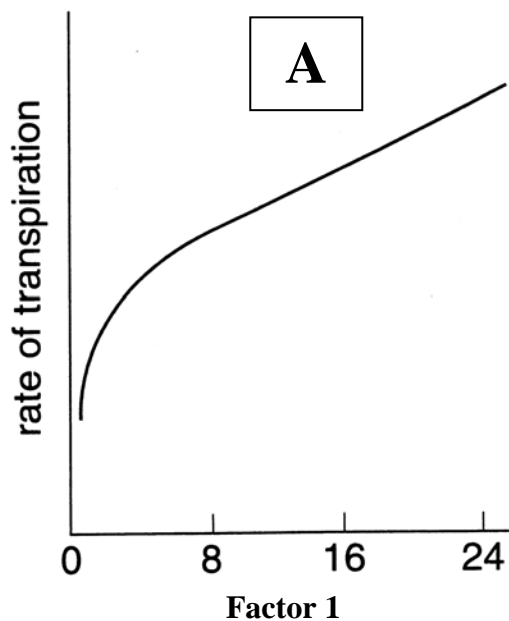
- b. Give TWO reasons why a gardener adds humus to sandy soil in a garden.

 _____ (2 marks)

- c. List ONE agricultural practice that increases soil erosion.

_____ (1 mark)
Total 7 marks

7. The following graphs (A, B and C) show the effect of three environmental factors on the rate of transpiration of a potted plant.



- a. Which graph shows the effect of humidity on the rate of transpiration? _____ (1 mark)

- b. The pore through which water leaves the plant is the stomata.

(i) Name the cells that open or close the stomata.

(ii) Most stomata close at night. Explain the benefit of this.

(1, 1 mark)

- c. Most plants living in hot dry environments have both shallow as well as deep roots. Explain.

_____ (2 marks)

- d. (i) Name the apparatus that can be used in the laboratory to measure the rate of transpiration of a leafy shoot.

- (ii) A group of biology students used the apparatus you name in d'i' to investigate a set of environmental conditions that influence the rate of transpiration in a plant. The following table lists the three sets of environmental conditions:

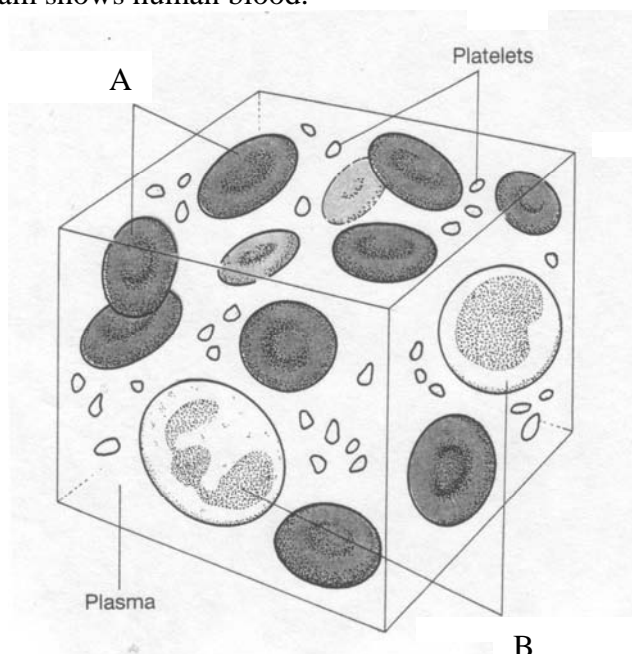
	Environmental Conditions
Z:	High light intensity and High temperature
Y:	Dark and windy
Z:	Dark and low humidity

In which of the three conditions would you expect the rate of transpiration to be the lowest?

(1, 1 mark)

Total 7 marks

8. The following diagram shows human blood.



- a. Name cell

A: _____

B: _____

(1, 1 mark)

- b. Give ONE structural difference between cell A and cell B.

_____ (2 marks)

- c. Blood is a tissue. Define the term tissue.

_____ (1 mark)

- d. Describe what happens to the number of cell A, in a person who climbs up a high mountain where there is lack of oxygen.

_____ (1 mark)

Total 6 marks

Section B

Answer any **THREE** questions from this section. Write your answers on a foolscap.

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

The drone-fly is not a bee

The drone-fly is one of several species of hoverflies that can be found in the Maltese Islands. These flies resemble bees and wasps in appearance and behaviour and manage to confuse predators that mistake them for the real thing and so leave them alone even though they do not have stings. This defence strategy is known as mimicry. The drone flies visit flowers for nectar and pollen.

- a. From the passage above choose the correct term that matches **each** of the following descriptions:
 - (i) a group of organisms within a genus
 - (ii) an animal that hunts another animal for its food. (1, 1 mark)
- b. Where is
 - (i) pollen
 - (ii) nectar
 produced in a flower? (1, 1 mark)
- c. List ONE other defence mechanisms (besides mimicry) that is used by some animals to avoid being caught. (2 marks)
- d. List the class to which hoverflies, bees and wasps belong. (1 mark)
- e. Most plants in an orchard are brightly coloured and scented. Explain. (1 mark)
- f. The larva of the drone-fly feeds on bacteria.
 - (i) Explain how bacteria can survive bad conditions such as drought.
 - (ii) List ONE way in which a bacterial cell differs from a typical animal cell. (2, 2 marks)
- g. In bees and flies the larva is quite different from the adult, but in locusts and grasshoppers the larva is a miniature version of the adult. Explain. (3 marks)

Total 15 marks

- 2a. (i) List TWO parts that provide support to a plant cell.
- (ii) Name ONE cell structure that you would not expect to find in a root cell. (2, 1 mark)
- b. What happens to plants if they are not watered regularly? (1 mark)
- c. A biology student had a light microscope with $\times 5$ and $\times 10$ eyepiece lenses and objective lenses of $\times 10$ and $\times 40$.
Work out the
 - (i) highest magnification
 - (ii) lowest magnification
 that can be achieved with this light microscope. (show your working) (4 marks)
- d. List ONE function of the
 - (i) roots
 - (ii) stem
 in a plant. (2, 2 marks)

- e. Farmers in Africa and South America use powerful insecticides to kill swarms of locusts.
- Why are locusts considered as pests by farmers?
 - List ONE advantage of using insecticides.

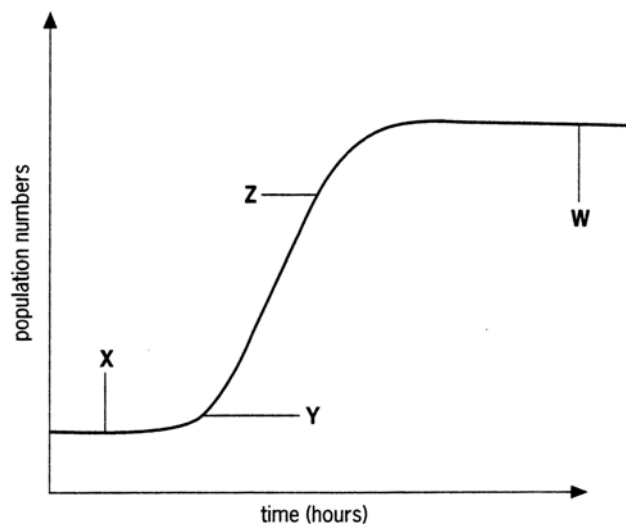
(1, 2 marks)
Total 15 marks

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

- Jellyfish sting.
- Spiders are not insects.
- Fish have a streamlined body covered with scales.
- Protists such as the Amoeba contain both food vacuoles as well as contractile vacuoles.
- The neurone (nerve cell) is a specialised cell.

(3, 4, 3, 3, 2 marks)
Total 15 marks

4. The following graph shows changes in the size of a population of yeast cells growing in a glass flask containing nutrient broth with glucose as a source of food.



- Name the kingdom to which yeast belong and list TWO other organisms in this kingdom.
(3 marks)
- Draw a labelled diagram of a yeast cell.
(5 marks)
- Name the process of asexual reproduction by which yeast reproduce and list ONE advantage of it.
 - List TWO other methods of asexual reproduction.
(3, 2 marks)
- From the population growth graph write the letter that presents the following stages in the growth of the yeast population:
 - the point at which the birth rate and death rate are equal.
 - the point at which population growth is most rapid.

(1, 1 mark)
Total 15 marks

5. The following diagram shows grass flowers.



- a. Grass flowers are wind pollinated.
From the diagram above list TWO pieces of evidence to show that grass flowers are wind pollinated.
(4 marks)
- b. What type of pollen grains would grass flowers produce?
(2 marks)
- c. Draw a labelled diagram to illustrate the process of fertilisation that follows pollination.
(5 marks)
- d. Distinguish between self-pollination and cross-pollination.
(2 marks)
- e. Describe what would happen if the seeds of a plant are all placed together in the same area of a field.
(2 marks)

Total 15 marks