

# KIAMBU INTERZONAL

## KENYA CERTIFICATE OF SECONDARY EDUCATION

231/2

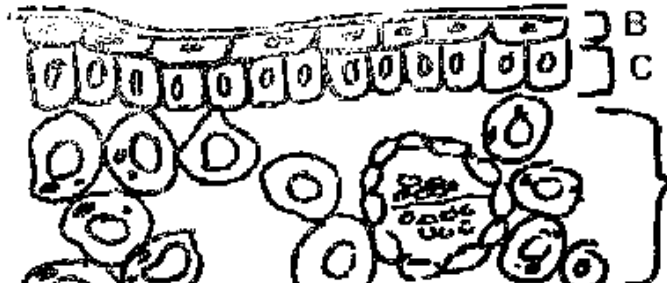
BIOLOGY(THEORY)

PAPER 2

JULY/AUGUST-2009

TIME: 2 HOURS

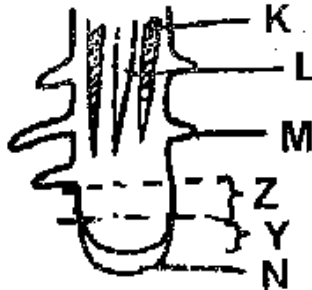
1. A student was observing a specimen using the high power objective but the image was not clear.
- (a) Which part of the microscope can be used to get a sharp image? (1 mark)
  - (b) Which parts of the microscope should be held when its being moved from one place to another? (2 marks)
  - (c) A cell was magnified 800 times using a light microscope whose eye piece was x20.  
What was the magnification of the objective lens/ (2 marks)
  - (d) Give reasons why microscopic sections require to be (3 marks)
    - (i) Stained
    - (ii) Very thin
    - (iii) kept wet during processing
2. (a) Distinguishing between Auto tropism and Heterotropism. (2 marks)
- (b) The diagram below represents a transverse section through a plant organ.



- (i) Identify the plant represented in the above diagram. (1 mark)
- (ii) Study the diagram carefully and name the following parts. (3 marks)
  - B
  - C

- H
- (iii) In which part of the plant organ does maximum photosynthesis take place? (1 mark)
- (iv) Give reason for your answer in 2. (b)(iii) above (1 mark)

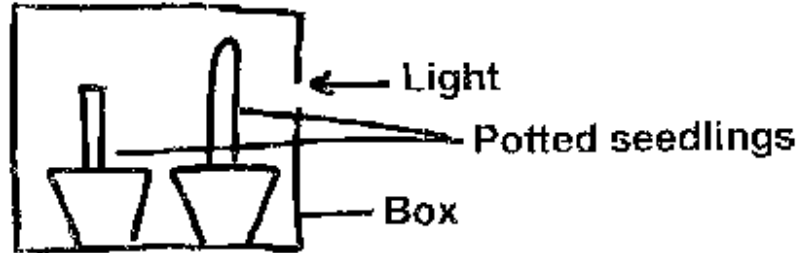
3. The diagram below represents a longitudinal section through a dicotyledonous root tip



- (a) Identify the structures labeled (3 marks)
- K
- L
- M
- (b) State the function of the part labeled N. (1 mark)
- (c) Name the process by which water moves from the soil particles into plant root. (1 mark)
- (d) How is the structural L different from that of the stem? (1 mark)
- (e) Name the zones labeled Y and Z (2 marks)
4. In a certain plant species, a red flowered plant when crossed with a white flowered plant produced plants with pink flowers ( $F_1$  generation).  
Selfing of  $F_1$  plants produced 84 plants. Let the gene for red colour be represented by letter R and gene for white colour by letter W.
- (a) (i) Work out the genotypes of the  $F_2$  generation. (4 marks)
- (ii) What is the phenotypic ratio of  $F_2$  (1 mark)
- (b) How many of  $F_2$  plants had pink flowers? (2 marks)
- (c) Name the type of inheritance exhibited by the plants above. (1 mark)

4. Two potted settings labeled q and L were treated as follows:  
 Q-tip of the seedling was cut.  
 L- tip of the seedling left intact.

The seedlings were then converted with a box which had a hole on one side and set up as shown below.



- (a) State the expected observations after three days. (2 marks)  
 Q  
 L
- (b) Explain the observations in (a) above. (2 marks)  
 Q  
 L
- (c) Name the type of response exhibited by the seedling in the experiment (1 mark)
- (d) State three applications of auxins in agriculture. (3 marks)

## SECTION B

Answer all question 6 and either question 7 or 8.

6. The data below shows the results of an investigation into the relationship between the rate of transpiration in moving and still air against stomatal aperture.

Stomatal aperture in microns		0	2.5	5	7.5	10	15	20
Stomatal transpiration	Moving air	10	60	90	125	150	200	250

Nono								
Grams per second /cm <sup>3</sup>	Still air	5	30	40	50	55	65	70

- (a) using a suitable scale draw on the same axes graph stomatal transpiration in moving nad in still air against stomatal aperture (x-axis) (8 marks)
- (b) Calculate the % change in stomatal transpiration in moving air compared to still air when stomatal aperture in 12.5 micrometers . Show your working out. (2 marks)
- (c) Account for the difference between stomatal transpiration in still air and moving air (4 marks)
- (d) Describe the relationship between transpiration and diameter of the aperture in still air. (3 marks)
- (e) State three other environmental factors that affects rate of stomatal transpiration. (3 marks)
7. Describe how human male reproductive system is adapted to perform its function. (20 marks)