

NAME \_\_\_\_\_ INDEX NO. \_\_\_\_\_

CANDIDATE'S SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

**231/1  
BIOLOGY  
PAPER 1  
(THEORY)  
JULY 2011  
2 HOURS**

**KIBWEZI SECONDARY SCHOOLS EXAMINATION  
Kenya Certificate of Secondary Education  
BIOLOGY  
PAPER 1  
THEORY  
2 HOURS**

**INSTRUCTIONS TO CANDIDATES**

Answer all the questions in the spaces provided after each question.

For Examiner's use only

Question	Max score	Candidate score
1 – 26	80	

**This paper consists of 9 printed pages**

**Turn Over**

1. (i) Name the locomotory response shown by paramecium moving from a location of low temperature to one of moderate temperature. (1mk)
- 
- 
- (ii) Of what survival value is the response exhibited by the paramecium. (1mk)
- 
- 
2. A spider is classified into class Arachnida of phylum Arthropoda
- (a) Name two distinguishing features of phylum arthropoda. (2mks)
- 
- 
- 
- (b) The body of the spider is divided into two main parts; name them (2mks)
- (i) \_\_\_\_\_
- (ii) \_\_\_\_\_
3. State two reasons why the stomach wall cannot be digested by the proteolytic enzymes (2mks)
- 
- 
- 
4. (a) Name two regions in woody plants where cells actively undergo mitosis. (2mks)
- (i) \_\_\_\_\_
- (ii) \_\_\_\_\_
- (b) Explain why sexual reproduction is important in organisms. (3mks)
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- 
5. Differentiate between homologous and analogous structures. (3mks)
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6. Name three tissues that provide support in a stem of a dicotyledonous plant. (3mks)

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7. (a) In what form is oxygen transported from the lungs to the tissues. (1mk)

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(b) Name the gaseous exchange surface of the following (i) Insect (1mk)

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(ii) Mammals (1mk)

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(iii) Amoeba (1mk)

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8. The diagram below shows a section of the gut and associated organs  
M N Liver

(i) Name the part labelled N (1mk)

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(ii) Explain how blockage of the part labelled M would interfere with digestion. (2mks)

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9. (a) What is mutation (1mk)
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- (b) Name 2 causes of mutations (2mks)
- 
- 
- 
- (c) Name a disorder of human blood that is caused by mutation (1mk)
- 
- 
10. (a) Name two growth regions above the root cap in ascending order (2mks)
- 
- 
- 
- 
- (b) What is the function of the root cap? (1mk)
- 
- 
- 
11. Outline the importance of each of the following in microscopy work.
- (i) Microscope sections must be very thin (1mk)
- 
- 
- 
- (ii) Microscope sections must be kept wet (1mk)
- 
- 
- 
- (iii) Staining microscope sections (1mk)
- 
- 
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12. (a) During germination and early growth the dry weight of endosperm decreases while that of the embryo increases. Explain (2mks)

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- (b) Explain the importance of water in germination (2mks)

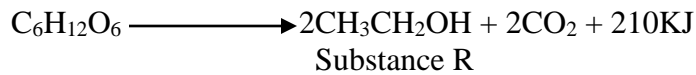
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13. The equation below represents respiration in a certain plant



- (a) (i) State the identity of substance R (1mk)

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- (ii) Give an equivalent of substance R in animals produced in a similar process. (1mk)

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- (b) (i) What name is given to the above type of respiration? (1mk)

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- (ii) Give a reason why it is often difficult to calculate respiratory quotient in plants. (1mk)

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14. (a) Give two methods used by plants for excretion. (2mks)

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(b) Name one plant excretory substance and state its economic importance (2mks)

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15. A buffalo in a national park was found to be infested with ticks. A white bird fed on the ticks and was being eaten by hawks.

(a) State the trophic level occupied by the white bird. (1mk)

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(b) Which of the organisms had the smallest biomass. (1mk)

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(c) Give a reason for your answer in (b) above (1mk)

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16. The figure below shows a type of a muscle

(a) Identify the muscle. (1mk)

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(b) In which part of the human body is the muscle likely to be found. (1mk)

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17. (a) Name the cartilage found between the bones of the vertebral column. (1mk)

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(b) State two functions of the cartilage named in (a) above. (2mks)

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18. What is the function of the following cells in the retina of the human eye. (2mks)

(a) Cones

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(b) Rods

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19. (a) State the role of the following hormones in homeostasis (i) Antidiuretic hormone/vasopression. (1mk)

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(ii) Aldosterone (1mk)

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(b) Explain why insulin is not administered orally. (1mk)

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20. Name the organelle which performs each of the following functions in a cell (i) Formation of cilia and flagella (1mk)

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(ii) Maintains osmotic properties of a cell. (1mk)

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(iii) Synthesises ribosomes (1mk)

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21. Study the diagram below of a section of a leaf epidermis  
A B

(a) Name the part labelled B (1mk)

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(b) How is the cell labelled A adapted to its function. (3mks)

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22. Name the carbohydrate which is:-

(a) Found in abundance in mammalian blood (1mk)

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(b) Stored in mammalian liver (1mk)

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(c) Transported in phloem of plants (1mk)

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(d) Stored in plant seeds (1mk)

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23. Define the following terms

(i) Allele (1mk)

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(ii) Testcross

(1mk)

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24. (a) What hormone is responsible for moulting in insects.

(1mk)

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(b) What is the importance of moulting in insects

(1mk)

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25. State two advantages which a constant body temperature gives mammals and birds over other animals

(2mks)

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26. Give two advantages of using low power magnification instead of high power magnification when viewing specimen under a light microscope.

(2mks)

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**231/1  
BIOLOGY  
PAPER 1  
(THEORY)  
JULY 2011**

**KIBWEZI SECONDARY SCHOOL EXAMINATION  
Kenya Certificate of Secondary Education  
BIOLOGY  
PAPER 1  
THEORY  
MARKING SCHEME**

1. (i) Positive thermotaxis; (1mk)  
(ii) Enables organism to escape from harmful stimuli; acc. Excess heat/organism able to seek favourable habitat;(1mk)
2. (a) Jointed appendages;  
Segmented body;  
Body covered by exoskeleton made of chitin; (Mark 1<sup>st</sup> 2 answers) (2mks)  
(b) Cephalothorax;  
Abdomen; (2mks)
3. Has mucus; covering its inner lining.  
Enzymes released in inactive form; e.g. pepsinogen; (2mks)
4. (a) Tip of shoot/tip of root; vascular cambium; cork cambium; acc. Apical meristem (2mks)  
(b) Brings about exchange/change of genetic materials, leads to variations; that enable organisms to exploit new environment/resistance to diseases/high yielding plants (3mks)
5. Homologous structures have common ancestry/embryonic origin; but have become modified to perform different functions; while analogous structures have different ancestry/embryonic origin; but are modified to perform similar functions; (3mks)
6. Xylem vessels and tracheids;  
Sclerenchyma;  
Collenchyma;  
Parenchyma; (mark 1<sup>st</sup> 3) (3mks)
7. (a) Oxyhaemoglobin; (1mk)  
(b) (i)Tracheoles (1mk)  
(ii) Alveoli (1mk)  
(iii) Cell membrane (1mk)
8. (i) Duodenum; reject small intestines (1mk)  
(ii) Prevents release of bile into duodenum; thus Preventing emulsification of fats; (2mks)  
NB: Mark (ii) correct if (i) is correct.  
Penalise (ii) if (i) is incorrect.

**This paper consists of 3 printed pages**

**Turn over**

9. (a) A sudden, spontaneous and permanent change in genetic constitution of an organism (1mk)
- (b) Chemicals e.g. colchicine, Mustard gas  
High temperatures;  
High energy radiations; acc x – rays (2mks)
10. (a) (i) Region of / zone of cell division;  
(ii) Zone of cell elongation; (2mks)
- (b) Root cap protect the apical meristem as the root grows through the soil; (1mk)
11. (i) Allows light to pass through making the components visible; (1mk)  
(ii) Prevents specimen from drying out which would distort the cells; (1mk)  
(iii) To make features more clearer and distinguishable; (1mk)
12. (a) Endosperm material/food reserves was being oxidized/converted/hydrolyzed into new cytoplasm; /and transferred to the embryo; (2mks)
- (b) - Activates enzymes;  
- Provides a medium for enzyme activity;  
- Water hydrolyses and dissolves stored food;  
- Medium of transport;  
- Softens seed coat (2mks)
- Mark 1<sup>st</sup> 2
13. (a) (i) Ethanol; (1mk)  
(ii) Lactic acid; (1mk)
- (b) (i) Anaerobic respiration; (1mk)  
(ii) Carbon (iv) Oxide produced in respiration is used in photosynthesis; (1mk)
14. (a) Exudation; Guttation; storage in plant parts like leaves, Diffusion; (Mark 1<sup>st</sup> 2 only)
- (b) Colchicine; in plant breeding to prevent spindle formation;  
Papain; meat tenderizer  
Quinine; as a drug to treat malaria  
Acc. Any correct use.
15. (a) Tertiary consumer; (1mk)  
(b) Hawk; (1mk)  
(c) As energy is transferred from one trophic level to the next a great proportion of energy is lost; hence less is available to support organisms in higher feeding levels; (1mk)
16. (a) Cardiac muscle; (1mk)  
(b) Heart; (1mk)
17. (a) Intervetebral disc; (1mk)  
(b) Acts as a cushion/absorbs shock; reduces friction; allows flexibility of the vertebral column;(2mks)  
(NB. Mark 1<sup>st</sup> 2)
18. (i) Colour perception/discrimination of colour/accurate vision/sensitivity to high light intensity/bright light; (1mk)  
(ii) Dim light vision/low light intensity sentivity; (1mk)

19. (a) (i) causes distal convoluted tubule/collecting duct to be more permeable to water; increasing reabsorption of water (1mk)  
(ii) Regulates level of sodium ions in blood; (1mk)
- (b) It is a protein and would be digested in the stomach before it reaches the liver for blood sugar regulation; (1mk)
20. (i) Centrioles; (1mk)  
(ii) Cell sap vacuole; (1mk)  
(iii) Nucleolus; (1mk)
21. (a) Stoma; (Reject stomata) (1mk)
- (b) Bean shaped and joined at the ends to leave a stomatal pore in between; have chloroplasts to carry out photosynthesis; to form solutes and vary osmotic pressure to facilitate opening of stomata; Have thicker inner walls to allow bulging outwards; (3mks)
22. (a) Glucose; (b) Glycogen; (c) Sucrose; (d) starch (4mks)
23. (i) The alternative form of a gene (1mk)  
(ii) Crossing a homozygous recessive organisms with an organism which shows dominant Characteristics (1mk)
24. (a) Ecdysone; (1mk)
- (b) Allows expansion of tissues hence growth;
25. Enables mammals and birds to inhabit a large variety of climatic conditions; permits metabolic activities to proceed at a relatively constant rates despite fluctuations in the environmental temperatures; (2mks)
26. - Gives a wider field of view so that a larger part of the specimen is seen; less light is absorbed as it passes through the microscope making the specimen look brighter/more visible  
Easier to focus and use the microscope; (2mks)

NAME \_\_\_\_\_ INDEX NO. \_\_\_\_\_

CANDIDATE'S SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

231/2  
BIOLOGY  
PAPER 2  
(THEORY)  
JULY 2011  
2 HOURS

**KIBWEZI SECONDARY SCHOOLS EXAMINATION**  
Kenya Certificate of Secondary Education  
BIOLOGY  
PAPER 2  
THEORY  
2 HOURS

**INSTRUCTIONS TO CANDIDATES**

Write your name and Index. No in the spaces provided

This paper consists of Two sections A and B

Answer all questions in section A and in section B, question 6 is compulsory: then choose one question between 7 and 8 and work the answer in the spaces provided after question 8.

For Examiner's use only

Section	Question	Max score	Candidate score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
	Total	80	

**This paper consists of 10 printed pages**

**Turn Over**

**SECTION A (40 MARKS)**

1. A group of student set up the following experiments to investigate the factors that affect enzymes. The contents of the set ups are given below.

Tube 1	Tube 2	Tube 3	Tube 4
Egg white, diastase at 36 <sup>0</sup> C	Boiled starch, dilute acid diastase at 36 <sup>0</sup> C	Boiled starch, diastase at 36 <sup>0</sup> C	Boiled starch, diastase at 60 <sup>0</sup> C

(a) Identify the property of enzymes being investigated in: (2mks)

(i) Tube 1

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(ii) Tube 2

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(b) After 3 hours the students tested the contents in the four tubes for starch using iodine solution.

They obtained the following results in tube 2, 3 and 4

Tube 2 – Blue – black

Tube 3 – No colour changes

Tube 4 – Blue – black

Account for the results obtained in tube 3 and 4?

(4mks)

Tube3

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Tube 4

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(c) What results would you expect in tube 3 if temperature was maintained at 5<sup>0</sup>C? Give a reason for your answer (2mks)

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2. The diagram below shows a certain cell as seen under the microscope. Study it and answer the questions that follow

C B A

(a) Name 3 structures that show this is a plant cell and not an animal cell. (3mks)

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(b) Name one chemical compound that is only found in the structure labelled A and state its functions (1mk)  
Chemical

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Function

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(c) What is the function of the fluid found in part labelled B. (2mks)

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(d) What is the main chemical compound found in the structure labelled C. (1mk)

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3. The diagram below shows the anterior view of one type of the bones of the vertebral column  
A B C

(a) Name the bone (1mk)

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(b) Which region of the body is it found (1mk)

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(c) Name parts

A \_\_\_\_\_ (1mk)

B \_\_\_\_\_ (1mk)

C \_\_\_\_\_ (1mk)

(d) Give three functions of this type of bone. (3mks)

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4. The diagram below shows some capillaries in a tissue. Use it to answer the questions that follow  
Blood flow Cells Blood flow X Y



(a) (i) Identify the type of blood vessel labelled X. (1mk)

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(ii) Name substance Y (1mk)

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(iii) How does Y differ from blood plasma (1mk)

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(iv) Name one substance that leaves the cells and gets into Y (1mk)

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(v) Name the process by which substances in Y get into the cells (1mk)

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(b) Of what advantage is it, for a red blood cell to

(i) Have a biconcave shape (1mk)

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(ii) Have haemoglobin (1mk)

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(iii) Lack a nucleus (1mk)

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5. Pure lines of black mice were crossed with pure lines of white mice. All the F1 generation were grey

(a) Work out

(i) The parental genotypes (2mks)

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(ii) The phenotypic ratio of the F2 generation after crossing the grey mice. (3mks)

(iii) If there were 480 grey mice in F2, calculate the number of black mice (2mks)

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(iv) Suggest the reason why F1 were all grey. (1mk)

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**SECTION B (40 MARKS)**

**Answer question 6 (compulsory) in the spaces provided and either question 7 or 8 in the spaces provided after question 8**

6. In an experiment on respiration, the rate of carbon (iv) oxide production in pea seedlings was recorded under different temperatures as shown in the table below.

Temperature ( <sup>0</sup> C)	Volume of carbon dioxide produced (cm <sup>3</sup> )						
	0 hr	1 <sup>st</sup> hr	2 <sup>nd</sup> hr	3 <sup>rd</sup> hr	4 <sup>th</sup> hr	5 <sup>th</sup> hr	6 <sup>th</sup> hr
30 <sup>0</sup> C	0.0	8.0	14.0	20.0	22.0	23.5	24.5
35 <sup>0</sup> C	0.0	10.0	17.5	22.5	25.0	26.5	27.0
40 <sup>0</sup> C	0.0	12.0	23.5	28.0	26.0	18.5	10.0

- (a) Using the same axis, plot graphs to show carbon (iv) oxide production at each temperature.

(Let time be on the x – axis)

(7mks)

(b) From the graph you have drawn, determine the time when the rate of respiration at 40°C was equal to that at:

(i) 30°C

(1mk)

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(ii) 35°C

(1mk)

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(c) (i) What is the optimum respiration temperature for this experiment

(1mk)

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(ii) Give an explanation for your answer in c (i) above.

(3mks)

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(d) Account for the shape of the graph when the reaction is maintained at 40°C.

(4mks)

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(e) Other than temperature, name three factors that affect the rate of respiration in plants. (3mks)

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**231/2  
BIOLOGY  
PAPER 2  
(THEORY)  
JULY 2011**

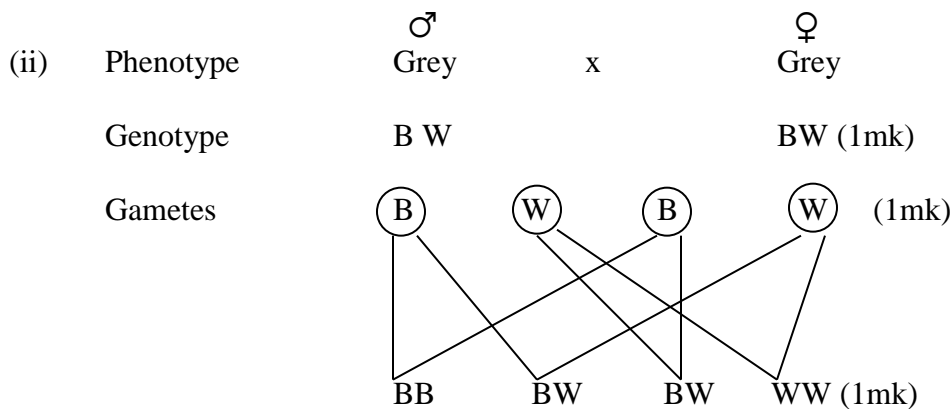
**KIBWEZI SECONDARY SCHOOL EXAMINATION  
Kenya Certificate of Secondary Education  
BIOLOGY  
PAPER 2  
THEORY  
MARKING SCHEME**

1. (a)(i) In tube 1 – Enzyme specificity/enzyme specific nature (1mk)  
(ii) In tube 2 – PH influence on enzyme activity/PH sensitivity (1mk)  
  
(b) Tube 3 – enzyme diastase hydrolysed/converted starch to simple sugars hence no colour change (2mks)  
Tube 4 – enzyme denatured by high temperature hence inactivated/starch not hydrolysed (2mks)  
  
(c) Would turn blue – black. Enzymes would be inactivated at low temperature hence starch not hydrolysed. (2mks)
2. (a) Cell wall; sap vacuole/ cell sap vacuole; chloroplasts; (3mks)  
  
(b) - Chlorophyll; (1mk)  
- Traps light energy for photosynthesis; (1mk)  
  
(c) Stores sugars, salts; thus maintain osmotic properties of the cell; (2mks)  
  
(d) cellulose/calcium acetate; (1mk)
3. (a) Lumbar vertebra (1mk)  
  
(b) Abdominal region (1mk)  
  
(c) A – Neural spine  
B – Neural canal  
C – Transverse process (3mks)  
  
(d) – Gives support to the heavy weight of the abdominal region  
- Provides surfaces for attachment of abdominal muscles  
- Protects and supports the heavy organs in the abdominal region (3mks)

**This paper consists of 5 printed pages**

**Turn over**

4. (a) (i) Venule; rej vein (1mk)  
(ii) Tissue fluid; (1mk)  
(iii) Has less proteins/has no blood cells; (1mk)  
(iv) Carbon (iv) oxide; reject wastes products; (1mk)  
(v) Diffusion; (1mk)
- (b) (i) Provide a large surface area for the diffusion of respiratory gases; (1mk)  
(ii) Haemoglobin has a high affinity for O<sub>2</sub>; enable a lot of O<sub>2</sub> to be absorbed; (1mk)  
(iii) Provides more room for packaging of haemoglobin ; more oxygen can be transported; (1mk)
5. (a) (i) BB and WW (2mks)  
(Rej. If B issued for white or W for black)  
(Rej; if small letters are used)



Phenotypic ratio Black: Grey: White  
1 : 2 : 1 (1mk)

- (iii)  $\frac{2}{4}$  of mice are grey = 480  
Therefore total no. of mice =  $\frac{4}{2} \times 480 = 960$   
Therefore Black mice =  $\frac{1}{4} \times 960 = 240$  (2mks)
- (iv) i.e. shows incomplete dominance where both genes controlling colour exert an effect on the phenotype of the offspring (1mk)

6. (a) Graph (attached)  
Labelling each curve 1 x 3 = 3mks  
Labelling each axis 1 x 2 = 2mks  
A suitable scale on each axis 1 x 2 = 2mks  
Total 7mks



(b) (i)  $4.5\text{hrs} \pm 0.2$  (1mk)

(ii)  $4.2\text{hrs} \pm 0.2$  (1mk)

(c) (i)  $35^{\circ}\text{C}$  (1mk)

(ii) The rate of respiration increases steadily because the temperature is suitable for enzyme activity; At  $30^{\circ}\text{C}$ , the temperature is limiting as there is room for more increase in rate of respiration; At  $40^{\circ}\text{C}$  most enzymes are denatured after a short period of time. (3mks)

(d) There is rapid increase in the rate of reaction upto an optimum of 3 hours; as enzyme is quickly activated. Thereafter a sharp decline in the rate of reaction; due to denaturing of enzymes (4mks)

(e) – Substrate concentration

- Enzyme concentration

- Oxygen concentration

- Presence of enzyme inhibitors/

Metabolic poisons/respiratory poisons

Mark first 3:  $3 \times 1 = 3\text{mks}$

## 7. Auxins

- Promotes root initiation
- Promotes formation of woody tissue and repair
- Promotes apical dominance
- Delays falling of leaves and fruits
- Promotes flowering in plants
- Promotes seed and bud dormancy
- Promotes fruit formation by parthenocarpy
- Promotes cell differentiation especially vascular tissue.

6mks

## Gibberellins

- Stimulates rapid cell division leading to root and stem elongation of dwarf varieties
- Breaks both seed and bud dormancy
- Induces flowering in long day plants
- Inhibits growth of adventitious roots
- Induces parthenocarpy in plants
- Retards leaf abscission
- Promotes leaf expansion

6mks

## Cytokinins

- Enhances cell division
- Stimulates leaf growth due to cell enlargement
- Promotes chloroplast development
- Delays aging of leaves by preventing formation of hydrolytic enzymes which degrade tissues
- Breaks dormancy in seeds
- Inhibits apical dominance
- Promotes flowering in some plants

4mks

Abscisic acid

- Accelerates abscission of fruits
  - Control closing of stomata
  - Inhibits stem elongation
  - Inhibits seed germination/hence cause seed dormancy
- 2mks

Florigen

- Promotes flowering
- 1mk

Ethene/Ethylene

- Facilitates ripening of fruits
- 1mk

8. (a) - Causes abortions; still birth/premature birth
- Results to underweight babies/smaller in size
  - Nicotine cause fits and convulsions to infants
- (b) - Cause lung cancer/lethal mutations; soot block cilia/bronchiole; preventing sweeping out of mucus/foreign particles; / causes chronic bronchitis.
- Cause emphysema/destruction of alveoli air spaces; leading to smaller surface area; for oxygen intake/less efficient in O<sub>2</sub> exchange
  - Nicotine deposits; cause coronary heart disease/coronary thrombosis
  - Nicotine stimulates release of adrenaline; hence increase in heart beat; and constriction of blood vessels/high blood pressure/increase cholesterol deposit; and blood clotting. 16mks

NAME \_\_\_\_\_ INDEX NO. \_\_\_\_\_

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DATE \_\_\_\_\_

**231/3**  
**BIOLOGY**  
**PAPER 3**  
**(PRACTICAL)**  
**JULY 2011**  
**1 ¾ HOURS**

**KIBWEZI SECONDARY SCHOOLS EXAMINATION**  
**Kenya Certificate of Secondary Education**  
**BIOLOGY**  
**PAPER 3**  
**PRACTICAL**  
**1 ¾ HOURS**

**INSTRUCTIONS TO CANDIDATES**

- (a) Write your name and index number in the spaces provided at the top of this page.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) Answer all questions in the spaces provided

For Examiner's use only

Question	Max score	Candidate score
1	13	
2	17	
3	10	
Total score	40	

**This paper consists of 6 printed pages**

**Turn Over**

Q 1. Study the photomicrograph attached of a transverse section of plant part and answer the questions that follow.

(a) (i) From what part of a plant was the section obtained (1mk)

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(ii) Give a reason for your answer (1mk)

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(b) (i) Name the class to which the plant belongs. (1mk)

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(ii) Give a reason for your answer in b(i) above (1mk)

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(c) Name the parts labelled (2mks)

A \_\_\_\_\_

F \_\_\_\_\_

(d) (i) What tissue makes up the part labelled B in a young plant. (1mk)

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(ii) Give two characteristics of the cells making up the tissue named in d (ii) above (2mks)

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(e) (i) What is the role of the part labelled D. (1mk)

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(ii) How is part D adapted to its function (1mk)

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(f) Using the scale shown on the photomicrograph calculate the diameter of the section from the point marked X to Y in cm. (2mks)

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2. You are provided with a specimen labelled K. Make a cross-section of the specimen using the scalpels Provided

(a) Draw a well labelled diagram of the section. (4mks)

(b) (i) What type of placentation is displayed by the above specimen? (1mk)

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(ii) Identify the method of dispersal of the above specimen. (1mk)

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(iii) Give reasons for your answer in (b) (ii) above.

(2mks)

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(c) Squeeze the juice out of the specimen and carry out food test using the reagents provided.(9mks)

Food sample	Procedure	Observation	Conclusion

3. The photograph in plate 4.2 represents the urinogenital system of a rat. Study it and answer the questions that follow.

adrenal body renal vein A B C vulva left kidney rectum D E anus

(a) What is meant by the term urinogenital? (1mk)

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(b) (i) State the sex of the rat in the photomicrograph above. (1mk)

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(ii) Give a reason for your answer. (1mk)

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(c) State one function of the parts marked A, B, D and E

(4mks)

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(d) (i) Name the substance found in the part marked c

(1mk)

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(ii) State one advantage and one disadvantage of the substance named in d (i) above, (2mks)

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231/3  
BIOLOGY  
PAPER 3  
(PRACTICAL)  
JULY 2011

KIBWEZI SECONDARY SCHOOL EXAMINATION  
Kenya Certificate of Secondary Education  
BIOLOGY  
PAPER 3  
PRACTICAL  
MARKING SCHEME

1. (a) (i) Root (1mk)  
(ii) Presence of endodermis and pericycle. (1mk)
- (b) (i) Monocotyledonae (1mk)  
Reject: monocot/monocotyledon.  
(ii) Vascular bundles arranged in a ring around a central pith (1mk)
- (c) A- Epidermis (1mk)  
F – Pith (1mk)
- (d) (i) Parenchyma tissue (1mk)  
(ii) – Thin walled  
- Irregular in shape  
- Loosely packed  
(Mark first two answers 2 x 1 = 2mks)
- (e) (i) It controls passage of water to the xylem. (1mk)  
(ii) It has the casparian strip. (1mk)

- (f) Diameter from X to Y in mm = 47 mm  
From scale

$$\begin{array}{l} 3\text{mm} \quad \text{—————} 1000\mu\text{m} \\ 47\text{mm} \quad \text{_____} ? \end{array}$$

$$\frac{47 \times 1000}{3} = \underline{\underline{15,667\mu\text{m}}} \quad \checkmark (1 \text{ mk})$$

Diameter in cm

$$\begin{array}{l} 10,000\mu\text{m} \quad \text{—————} \quad 1\text{cm} \\ 15,667 \mu\text{m} \quad \text{—————} \quad ? \end{array}$$

$$\frac{15,667 \times 1}{10,000} = \underline{\underline{1.57\text{cm}}} \quad \checkmark (1 \text{ mk})$$

*This paper consists of 3 printed pages*

*Turn Over*

2. (a)

Mg = 1/2 / x 1 (1mk)

Labels each 1/2 - marking 4 correct labels (2mks)

Drawing marks (1mk)

(b) (i) Axile

(ii) Animal; accept man

(iii) Reasons – Succulent/juicy

- Aromatic/scented

- Brightly coloured/conspicuous.

(c)

Food sample	Procedure	Observation	Conclusion
Starch	To juice add iodine solution✓	Colour of iodine remains/brown colour retained✓	Absence of starch✓
Glucose	Add benedicts solution; and heat✓	Colour changes from blue – green – yellow – orange/brown/ a brown ppt formed✓	Presence of reducing/simple sugar✓
Ascorbic acid/Vitamin C	Add the juice to DCPIP (drop by drop)✓	DCPIP is decolourised/decolourises/clear solution forms✓	Presence of vitamin C✓

(9mks)

NB: If food sample not identified stop marking if procedure is wrong stop marking.

3. (a) Serves both roles of genital organ as well as excretion by urine removal (1mk)

(b) (i) Female (1mk)

(ii) Have vulva; oviduct (1mk)

(c) Functions of parts

A- Site for oogenesis/ova production; secretion of hormones: (Oestrogen) (part A is (right) ovary;

B – Site for fertilization; part B is fallopian tube. (1mk)

D – Allows urine into the urinary bladder/ part D is ureter (1mk)

E – Site for copulation; serves as birth canal; pathway for urine removal; part E is vagina. (1mk)

(d) (i) urine (1mk)

(ii) Advantages

Provides a means of elimination of nitrogenous waste, acidic and thus offers some sterility to the urethra of the penis during copulation . (1mk)

Disadvantages

Causes acidity in the urethra which leads to killing of sperm cells. (1mk)