

Name: ..... School: .....

Index No. ....

**231/ 2**  
**Biology**  
**Theory**  
**Paper 231/ 2**  
**July/ august 2014**

**MMS JOINT EXAMINATION - 2014**  
*(Kenya Certificate of Secondary Education (K.C.S.E))*

**231/ 2**  
**Biology**  
**Theory**  
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**INSTRUCTIONS TO CANDIDATES:**

- Answer ALL questions in section A by filling in the spaces provided
- In section B, answer question 6 (compulsory question) and any other one question from the remaining two questions. (i.e 7 or 8)

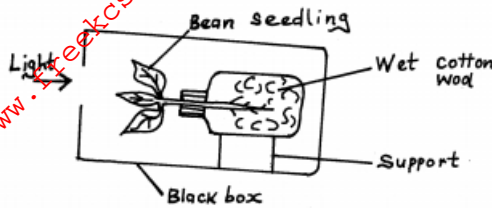
**FOR EXAMINER USE ONLY**

<b>Section A</b>	<b>Questions</b>	<b>Maximum score</b>	<b>Candidates score</b>
<b>A</b>	<b>1</b>		
	<b>2</b>		
	<b>3</b>		
	<b>4</b>		
	<b>5</b>		
	<b>6</b>	<b>20</b>	
	<b>7</b>	<b>20</b>	
	<b>8</b>	<b>20</b>	
	<b>Total score</b>	<b>80</b>	

*This paper consists of 12 printed pages.  
Candidates should check the question paper to ensure that all the  
Pages are printed as indicated and no questions are missing.*

**SECTION A (40 MARKS)**

1. The diagram below represents an experimental set up to investigate effects of gravity and light on the growing seedling.

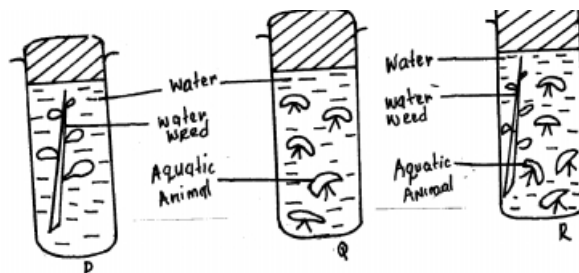


- a) (i) Draw a diagram of the seedling to experiment the expected results after three days (2mks)
- (ii) Explain the appearance of the seedling in a (i) above. (4mks)
- b) Suggest a control experiment for the gravity in this experiment. (1mk)
- c) State **one** importance of the type of response shown in the experiment above. (1mk)

2.

- a) Give the reason why the following must be regulated in the donkey.
- i. Temperature. (2mks)
- ii. PH. (2mks)
- b) Describe how the level of blood sugar in man is maintained. (4mks)

3. Three jars were set up as shown below:-



Four (4) drops of phenol indicator were added to each jar. The phenol indicator was red at the beginning of the experiment. Phenol changes from orange red to yellow at PH 6.8. After 3 hours in sunlight, the following results were obtained:

Jar	Colour of indicator
P	Red
Q	Yellow
R	Orange red

- a) Give **two** ways of bringing a colour change from orange red to yellow in jar R. (2mks)
- b) Account for the colour changes in jar:
- i. P (3mks)

ii. Q (3mks)

4. A bull with coat of red colour was crossed with a cow of white colour coat.

The calf produced had a coat of roan colour.

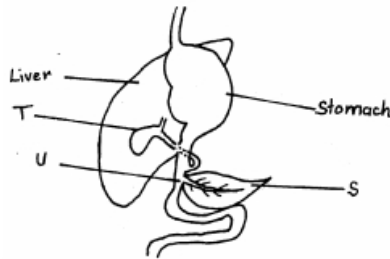
a) Explain the appearance of a roan coat colour on the calf. (1mk)

b) The roan colour after attaining maturity was black crossed with a bull of red coat colour. Work out the phenotypic ratio of the offsprings produced (4mks)

c) State how genetics can be used in the field of Agriculture. (1mk)

d) State **two** sources of discontinuous variation. (2mks)

5. The diagram below shows a section of the human alimentary canal. Study it and answer the questions that follows:



a) Name the parts labeled:-

S.....

U.....

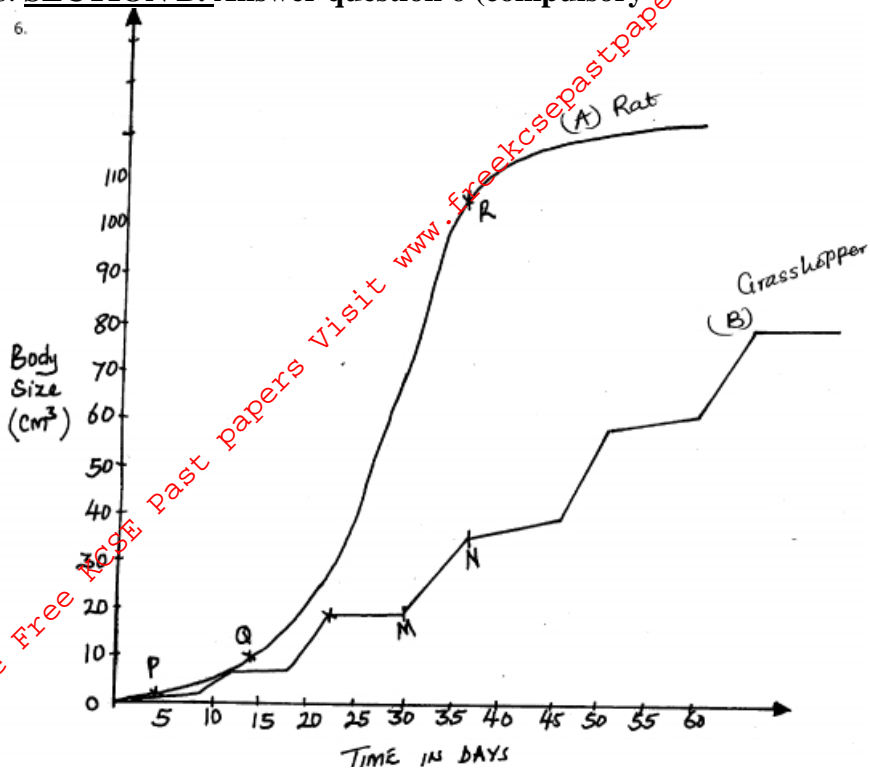
(2mks)

b) Explain the functions of the contents stored in T in the digestions. (2mks)

i. Name **two** enzymes contained in the substance secreted by S. (2mks)

ii. State the functions of the enzymes named in c(i) above. (2mks)

6. SECTION B. Answer question 6 (compulsory)



The above graph shows growth of two organisms. A rat and a grasshopper over a period of time.

a) Identify the growth pattern represented by graphs:-

A.....

B..... (2mks)

b) Account for the shape of graph B. (4mks)

c) Name the hormone responsible for the process that occurs between M and N, which facilitates increase in the body size. (1mk)

d) Account for the shape of graph A between

i. P and Q. (3mks)

ii. Q and R. (4mks)

e.i. Name the type of fertilization that is shown in rats. (1mk)

ii. Give **two** advantages of the type of fertilization named in e (i) above. (2mks)

f.i. Name the type of cell division that leads to formation of spermatozoa in man. (1mk)

ii) Name **two** chromosomal events that occur in the type of cell division named in

f (i) above. (2mks)

**ESSAYS**

7. Describe the importance of a balanced diet in children. (20mks)

8. How is the gaseous exchange system of a mammal adapted to perform its functions? (20mks)