

Name: Index No.....

Adm. No..... Candidate's Signature:..... Date:.....

231 / 1

BIOLOGY

PAPER 1

(THEORY)

MARCH, 2015

2 HOURS

FORM FOUR LAINAKU PRE-MOCK

BIOLOGY

PAPER 1

Instructions to Candidates:

- (a) Write your Name and Index Number in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) Answer ALL the questions.
- (d) Answers must be written in the spaces provided in the question paper.
- (e) Additional pages MUST NOT be inserted.
- (f) This paper consists of 11 printed pages.
- (g) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
- (h) Candidates should answer the questions in English.

For Examiner's use only.

Question	Maximum Score	Candidate's Score
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1 - 31	80	
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1. The following is a dental formula of a certain animal.

$$\begin{matrix} i & \underline{3} & c & \underline{1} & pm & \underline{4} & m & \underline{2} \\ & 3 & & 1 & & 4 & & 3 \end{matrix}$$

(i) Define the mode of feeding exhibited by the animal.

..... (1 mk)

(ii) Give an example of an animal bearing such dental formula. (1 mk)

.....

2. The scientific name of a lion and a leopard are *Panthera leo* and *Panthera pardus* respectively.

(a) Name the Genus to which the two belong. (1 mk)

.....

(b) Explain why they cannot interbreed. (1 mk)

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.....

(c) Which division of plants does the moss plant belong? (1 mk)

.....

3. Palisade layer forms a special tissue in plants.

(a) Which physiological process are they specialised in?

..... (1 mk)

(b) (i) Name the organelle that makes palisade cells suitable for the process named above. (1 mk)

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(ii) What role does the organelle named above play in the process stated in 3(a)? (1 mk)

.....
.....

4 (a) Apart from magnification, state the other function of a microscope. (1 mk)

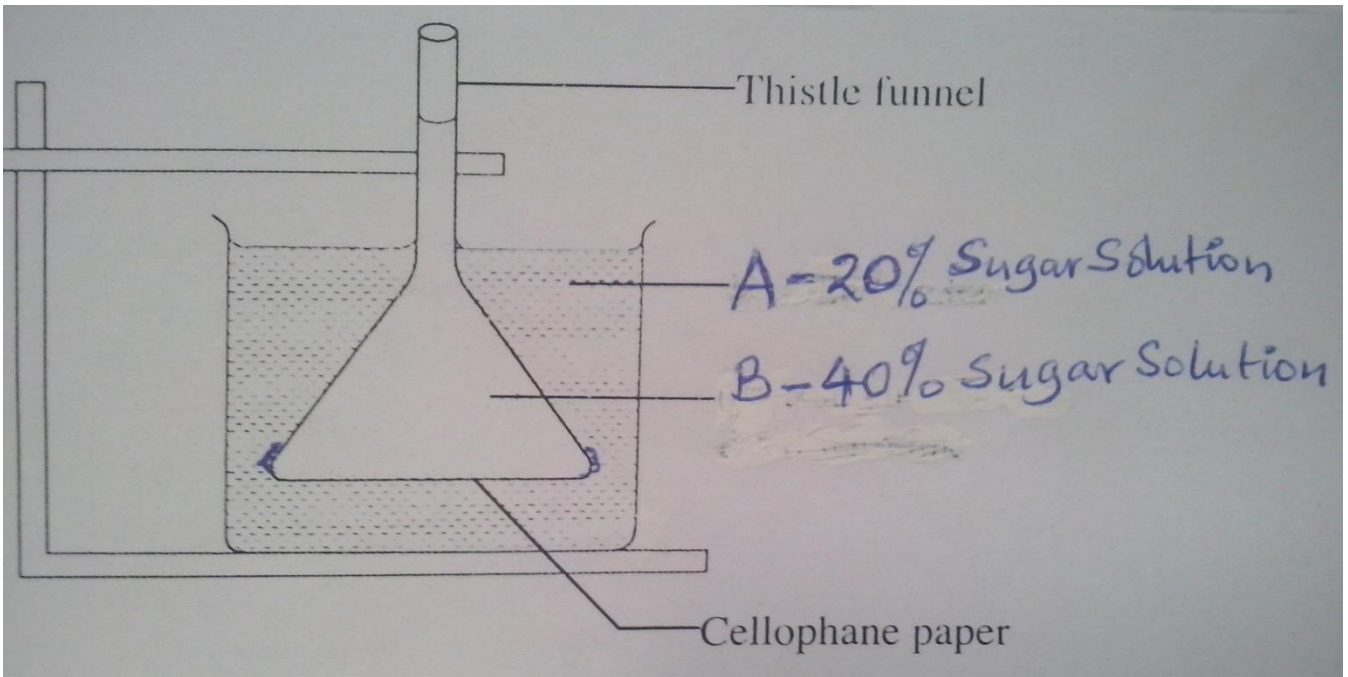
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(b) Name the type of a microscope that is best for the function named in 4(a) above. (1 mk)

.....

.....

5. The diagram below shows a set up for an experiment to demonstrate a certain physiological process.



(a) State the expected direction of water movement between the two solutions. (1 mk)

.....

(b) Define the process under investigation . (2 mk)

.....

.....

6. The growth curve is sigmoid.

(i) Name the first two phases of the curve. (2 mks)

.....
.....

(ii) Explain the decelerating phase of the curve. (1 mk)

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.....

7. Paramecium, Amoeba and Plasmodium belong to one kingdom.

(a) Name the kingdom (1 mk)

(b) State two characteristics of the group. (2 mk)

.....
.....

8. Food is broken down in cells of living things to release energy.

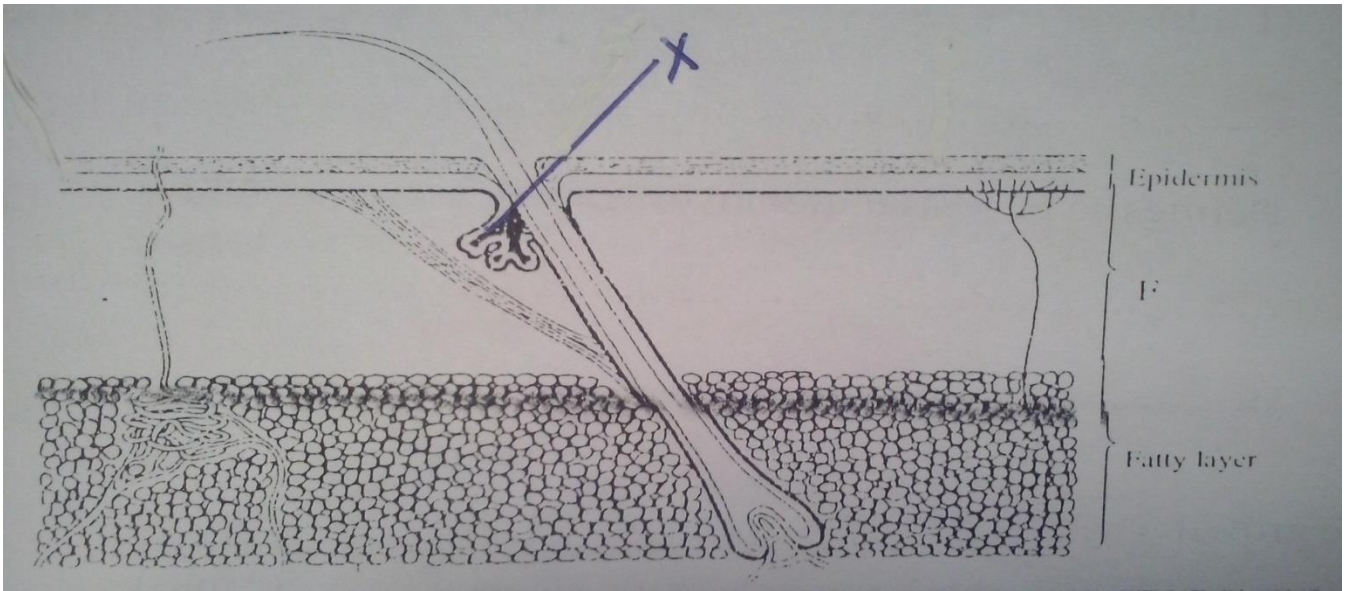
(a) Name the physiological process involved. (1 mk)

.....

(b) State a difference between the process named above and gaseous exchange. (2 mks)

.....

9. Below is a diagram of a transverse section through a certain organ.



(a) State two functions of the organ. (2 mks)

.....

.....

.....

(b) Name the part labelled X. (1 mk)

.....

10 (a) Explain briefly why the number of organism above a given trophic level keeps on reducing in an ecosystem. (2 mks)

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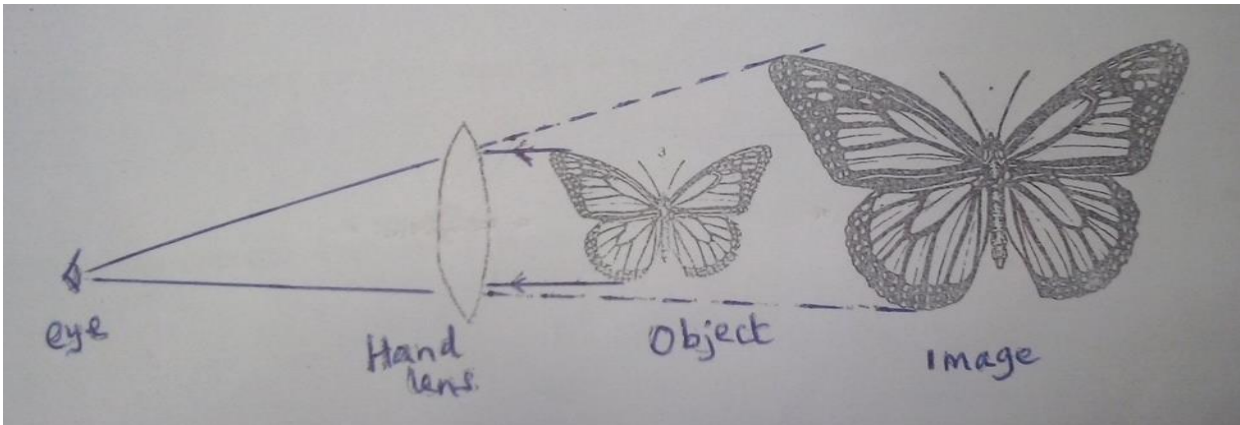
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(b) Give an example of a situation that can lead to an inverted pyramid of numbers. (1 mk)

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.....

11. Below is a linear representation of a magnification of a butterfly when a hand lens is used.



(a) Calculate the total magnification. (2 mks)

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.....

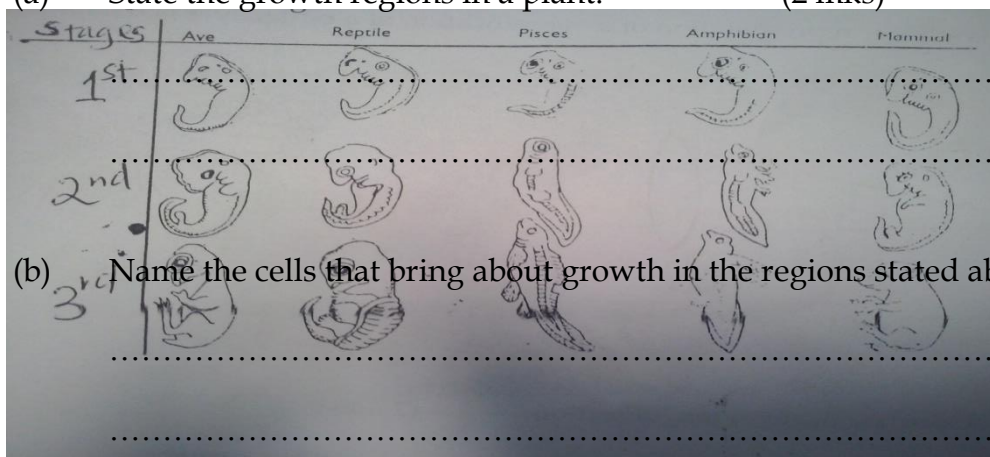
(b) Name the parts of a microscope that replaces a hand lens in the above set up (2 mks)

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12. Growth in plants takes place only in specific regions.

(a) State the growth regions in a plant. (2 mks)



(b) Name the cells that bring about growth in the regions stated above. (1 mk)

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13. The diagrams below illustrate embryos of various vertebrates under three developmental stages.

Suggest the stage of development exhibiting the highest degree of morphological similarity. (1 mk)

.....

14 (a) What role in reproduction does a penis play? (1 mk)

.....

(b) What part of a flower produces male gametes? (1 mk)

.....

15 (a) Define Mutagens. (1 mk)

.....

.....

(b) State two examples of mutagens. (2 mks)

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.....

16 (a) Define an Allele. (1 mk)

.....
.....

(b) Distinguish between Heterozygote and Homozygote. (2 mks)

.....
.....

17. Hydrophytes are classified into emergent and submergent plants.

(a) Name the tissue responsible for buoyancy in the emergent type. (1 mk)

.....
.....

(b) State two adaptations for this type of plants. (2 mks)

.....
.....

18 (a) Distinguish between Sexual and Asexual reproduction. (2 mks)

.....
.....

(b) Name the sexual reproductive organ in plants. (1 mk)

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19. Below is a table indicating blood components of three Kenyan citizens; Sofia, Dorminic and Harriet. Use the table to answer the questions that follow.

Blood component	Sofia	Dorminic	Harriet
Red blood cells / 100cm ³	7900	6000	2100
White blood cells / 100cm ³	60	7000	6000

Platelets / 100cm ³	260000	270000	6000
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Suggest with a reason which of them lives in the highest altitude. (2 mks)

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20. Explain how the gas produced during the process of photosynthesis is tested and state the expected observation. (2 mks)

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21 (a) State two beneficial effects of transpiration to plants. (2 mks)

.....
.....

(b) State one force that maintains transpiration. (1 mk)

.....
.....

22 (a) Name two organisms that use skin as a respiratory organ. (2 mks)

.....
.....
.....

(b) Falling of leaves is important as far as management of waste products in plants is concerned. Explain. (1 mk)

.....
.....

23 (a) Which branch of Biology deals with the study of insects? (1 mk)

.....

(b) (i) Name the phylum insects belong to. (1 mk)

.....

(ii) Name one characteristic of phylum. (1 mk)

.....

24. What is the functional difference between vitamin C and A? (2 mks)

.....

25 (a) If the pancreatic duct is blocked the blood sugar level of a person will still be regulated. Explain. (2 mks)

.....

.....

(b) Which process will be affected by the blocking? (1 mk)

.....

26. Why is the energy production in Aerobic respiration more than in Anaerobic respiration. (2 mks)

.....

.....

27. Some people saw a sick person and suggested he had contracted the disease Ebola.

(i) Suggest a likely reason for their suspicion. (1 mk)

.....

.....

(ii) Name the causative agent of Ebola..... (1 mk)

28. A person's heart beat increases after a vigorous exercise.

(i) State a reason for the increased heart beat.....
.....(1 mk)

(ii) What respiratory product would be found in plenty in his muscles? (1 mk)
.....

29. In physiology we study processes of diffusion, osmosis and active transport. Explain what makes active transport different from the other two. (1 mk)

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.....

30. Distinguish between Wilting in plants and Crenation in cells. (2 mks)

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.....
.....

31 (i) How is mucus important in the process of digestion? (2 mks)

.....
.....
.....

(ii) At what part of the Alimentary Canal does the chyle change into solid faeces? (1 mk)

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.....

NAME.....ADM.....CLASS.....

231/2
BIOLOGY PAPER 2
(Theory)
2 HOURS

FORM FOUR PRE-MOCK LAINAKU EXAM – TERM 1 2015 BIOLOGY PAPER 2

Instructions to candidates

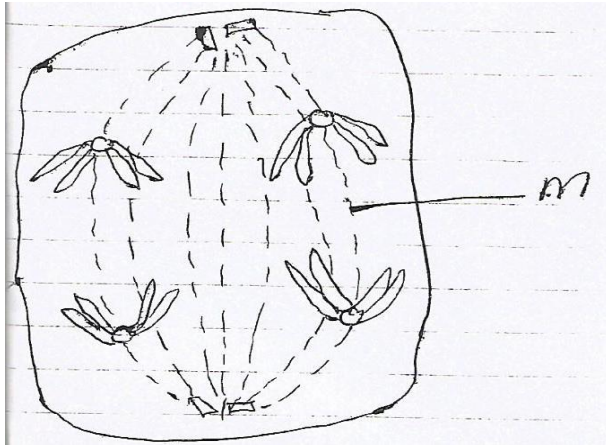
- (a) Write your name, admission number and class in the spaces provided.
- (b) This paper consists of TWO sections. A and B.
- (c) Answer all the questions in section A in the spaces provided.
- (d) In section B answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

For Examiner’s Use Only

Section	Question	Maximum Score	Candidate’s score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7	20	
	8	20	
Total		80	

SECTION A – 40 MKS

1. The figure below represents a stage during cell division



- a) i) Identify the stage of cell division (1 mk)
- ii) Give two reasons for your answer in (a) (i) above. (2 mks)
- (b) Name structure m (1 mark)
- (c) State two disadvantages of sexual reproduction in animals. (2 mks)
- (d) State three differences between mitosis and meiosis (3 mks)

Mitosis	Meiosis

2. An experiment was carried out where a variety of garden peas having a smooth seed coat was crossed with a variety having a wrinkled seed coat. All the seeds obtained in F1 generation had smooth coat. The F1 generation was selfed. The total number in F2 generation was 7324.

(a) Using letter R to represent the gene for smooth seed coat, work out the genotypes of the F1 generation (5mks)

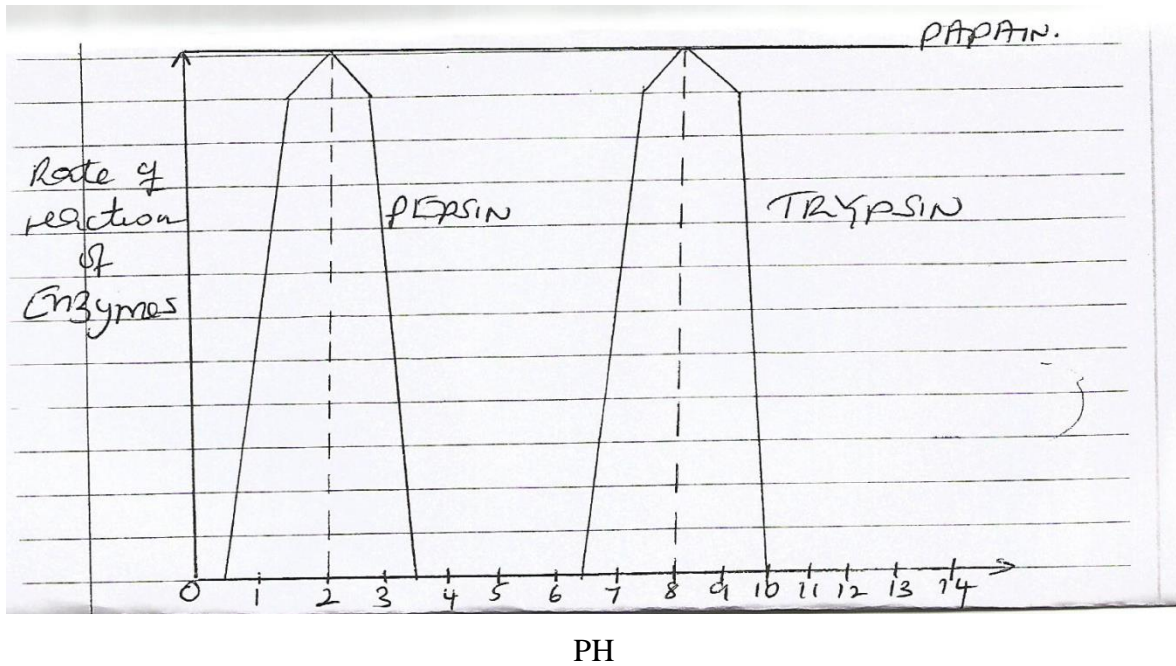
(b) From the data (a) above, work out the following for the F2 generation.

i) Genotypic ratio (1mk)

ii) Phenotypic ratio (1 mk)

iii) The total number of wrinkled seeds. (2 mks)

3. The curves in the graphs below show the relationship between PH and the reactive activity of three different enzyme proteases-Trypsin, pepsin and papain.



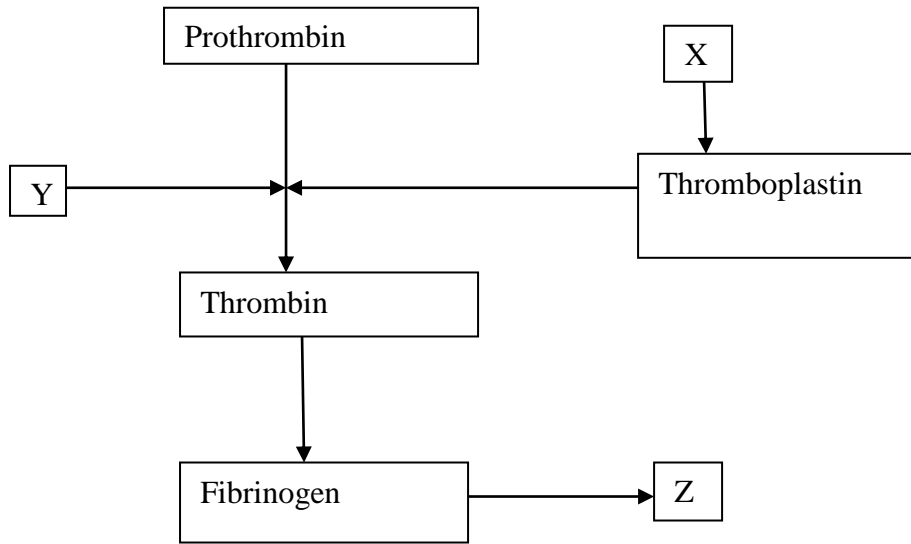
(a) (i) Explain why changes in PH normally affect the activity of enzyme. (2 mks)

(ii) Comment on the effects of changes in pH on the activity of trypsin, pepsin and papain. Base your answer on the relative activity of each enzyme. (2 mks)

(iii) Of the three enzymes, which would be most suitable as meat tenderizer. State one reason for the answer. (1mk)

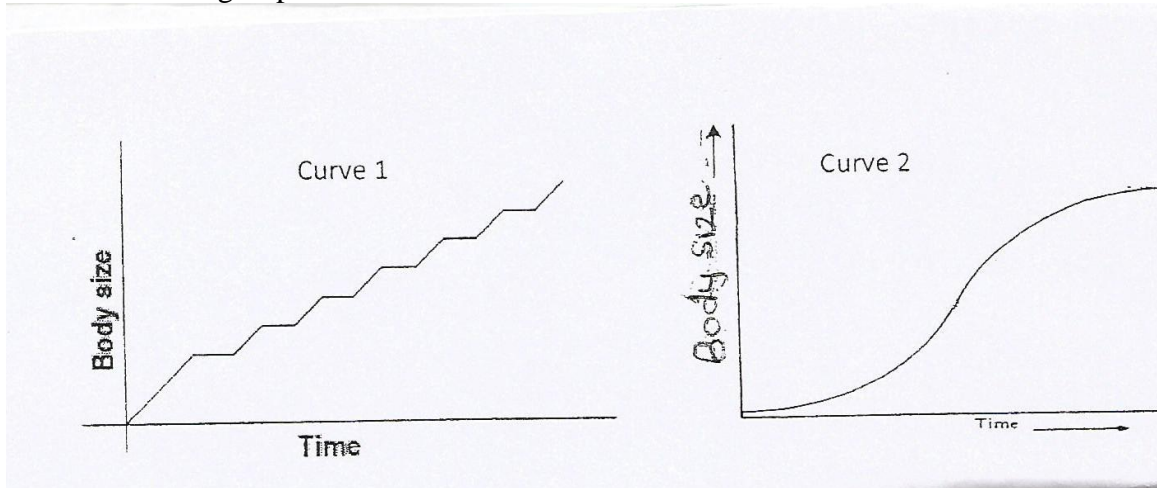
(iv) Rennin an enzyme extracted from the stomach of calves is used in the manufacture of cheese. Describe the effect rennin has on milk. (2 mks)

(b) Study the figure below and answer the questions that follow.



- (i) Name the blood cells represented by X. (1 mk)
- (ii) Name the metal ion represented by Y. (1 mark)
- (iii) Name the end product of the mechanism represented by Z. (1mk)
- (iv) What role does vitamin K play in the above process? (1mk)
- (v) State two importance of blood clotting in man. (2mks)

4. Below are two graphs showing two growth curves

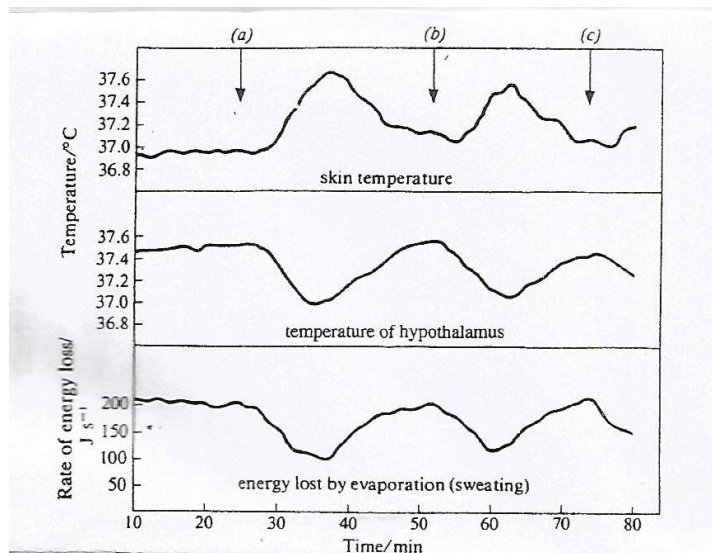


(a) Name the two curves. (2 mks)

- 1
- 2

(b) Name the hormone involved in the type of curve represented by 1 (1 mk)

5. The graph below shows the relationship between skin temperature of the hypothalamus and rate of evaporation for a human in warm chamber (45°C). Iced water was swallowed at the ports marked (a), (b) and (c).



(a) Suggest why iced water was not given until 20 minutes after the start of the experiment. (2 mks)

(b) Describe the relationship between the temperature of the hypothalamus and the rate of sweating. (2 mks)

(c) Suggest why the skin temperature rises shortly after the ingestion of iced water. (2 mks)

SECTION B (40MKS)

Answer questions 6 (compulsory) and either question 7 or 8 in the spaces provide after question 8.

6. An experiment was carried out to investigate the effect of heat on germination of seeds. Eleven bags each containing 50 bean seeds were placed in a water bath maintained at 90⁰c. After every 2 minutes, a bag was removed and the seeds contained in it planted. The number that germinated was recorded.

The procedure used for the bean seeds was repeated for Acacia seeds. The results obtained were as shown in the table below.

Time (min)	Number of seeds that germinated	
	Bean seeds	Acacia seeds
0	50	0
2	50	0
4	46	1
6	35	2
8	10	28
10	1	36
12	0	41
14	0	44
16	0	47
18	0	48
20	0	50

a) Using a suitable scale and on the same axes, draw a graph of the number of seeds that germinated against time in hot water for each plant. (7mks)

Note;provide graph papers, ’

b) i) After how many minutes would you expect 50% of Acacia seeds exposed to the hot water to germinate? (1mk)

ii) What was the minimum number of minutes after exposure of bean seeds to hot water was there no germination. (1mk)

- c) i) From the graphs, which one of the two types of seeds was more sensitive to heat influence on germination. (1mk)
- ii) Give a reason for the answer in c(i) above. (1mk)
- d) Explain why the ability for the;
- i) Bean seeds to germinate declined with time of exposure to heat. (2mks)
- ii) Acacia seeds to germinate improved with time of exposure to heat. (3mks)
- e) What results would be expected if the temperature of the water was retained at;
- i) 100⁰c (2mks)
- ii) 5⁰c (2mks)
7. a) i) Define the term organic evolution. (2mks)
- ii) Distinguish between homologous and analogous structures. (2mks)
- iii) Discuss the various evidences of organic evolution. (16mks)
8. a) State any two functions of the placenta. (2mks)
- b) Describe the role of hormones in the human menstrual cycle. (18mks)

NAME ADM NO.

SCHOOL DATE CLASS.....

231/3

BIOLOGY

(PRACTICAL)

MARCH/APRIL 2015

1 ¾ HOURS

LAINAKU FOUR PRE MOCK EVALUATION TEST

KENYA CERTIFICATE OF SECONDARY EDUCATION (K.S.C.E) 2015

231/3

Biology

(PRACTICAL)

INSTRUCTIONS TO CANDIDATES

1. Write your name in the space provided at the top of this page.
2. Answer all the questions.
3. You are required to spend the first 15 minutes of the time allowed for this paper reading the whole paper carefully before commencing your work.
4. Answers must be written in the space provided in the question paper.
5. Additional pages must not be inserted.

For Examiners Use Only

Question	Maximum score	Candidates score
1	13	
2	15	
3	12	
Total score	40	

1. You are provided with a specimen labeled K. solution P. solution Q and a plastic ruler

a. Remove one of the inner leaves from the specimen K. Cut the leaf along the length into nine strips. Each strip should measure about 2mm wide. Place three strips into the solution labeled P. Place another three strips into the solution labeled Q, leave the last three strips in a petri dish labeled R. Allow the experimental set-ups to stand for 15 minutes.

(i) Using your fingers to feel the texture of the strips. Record your observation

Strips in solution P (1mk)

Strip in solution Q (1mk)

(ii) Account for the texture of the strips in solution Q (2mk)

(iii) Suggest the concentration of solution P in relation to the cell sap in the strips of the specimen

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

(v) State the aim of the set-up R. (1mk)

b. Using the plastic ruler provided estimate the diameter of the field of view of the microscope when the low power objective is in position

(i) Diameter of the field of view in millimeters _____ (1mk)

(ii) Convert the diameter of the field of view millimeters to micrometers

Show your working (2mks)

c. Remove another fleshy leaf from the specimen K. Peel the epidermis from the inner surface of the leaf using the pair of forceps. Place the epidermis in a drop of water on a slide. Place a cover slip on epidermis. Place one drop of Iodine solution at one edge of the cover slip. Using a tissue paper, draw off excess Iodine solution and water from the opposite's edge of the cover slip. Observe the epidermis under low power. Count the number of cells along the diameter of the field of view

(i) Number of cell _____ (1mk)

(ii) Calculate the diameter of one cell in micrometers . show your working (2mks)

(iii) What is the role of iodine in the procedure? (1mk)

2. You are provided with a specimen labeled M. with the use of a hand lens, examine the specimen

a. (i) State the phylum to which the specimen belongs. _____ (1mk)

(ii) Using the observable features only, name the class to which the specimen belongs (1mk)

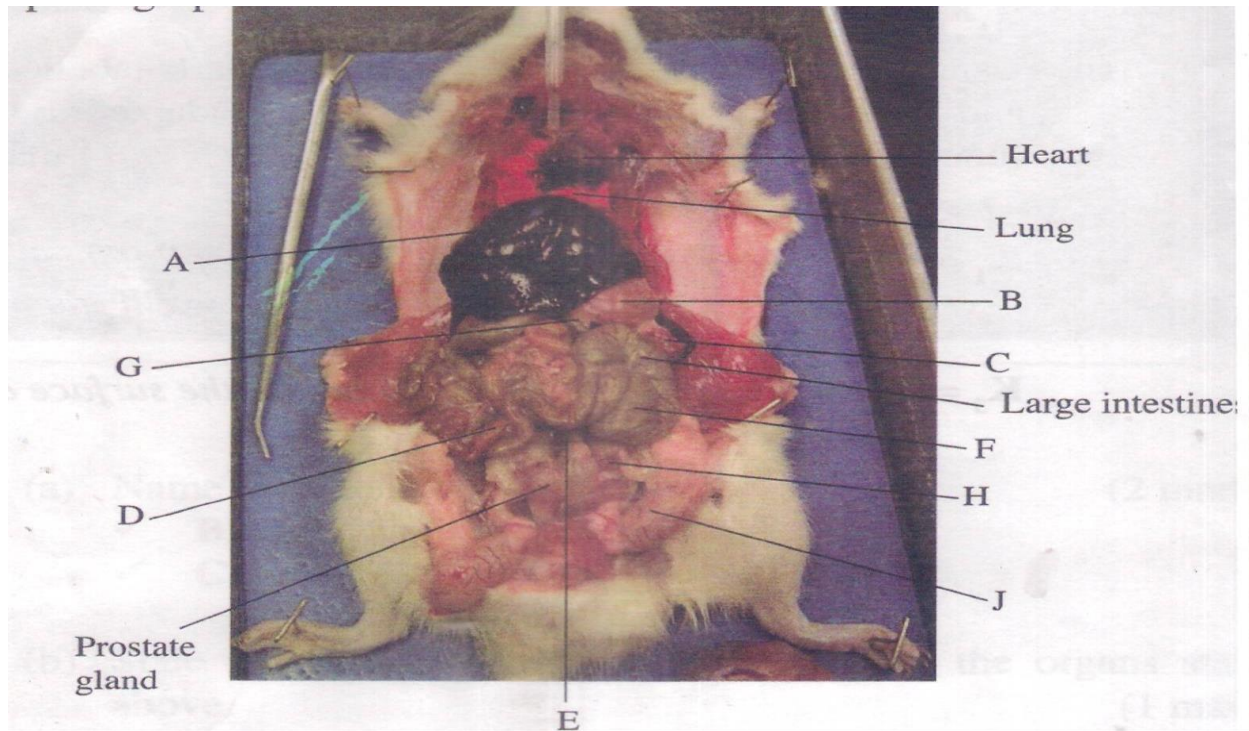
(iii) Give one reason for your answer in (a) (ii) above (1mk)

b. Using the observable features only, state how the specimen is adapted to living in its habitat. (4mks)

c. Cut three of the specimen into tiny pieces. Place the pieces into a boiling tube. Add 5ml of water. Boil for five minutes. Decant the extract into a clean test tube .Using the reagents provided, identify the food substances present in the extract .Record the food tested for, observations and conclusions in the table below (8mks)

Food Substance	Procedure	Observations	Conclusion

3. Below is a photograph of a dissected mammal. Examine the photograph.



a. Name the parts labeled A, B, C, D and G (5mks)

- A _____
- B _____
- C _____
- D _____
- G _____

b. State the function of the structure labeled E and F (2mks)

- E _____
- F _____

c. i) Name the sex of the mammal in the photograph _____ (1mk)

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

d. The actual length of dissecting tool placed at the anterior end of the mammal is 11.5 cm

(i) Determine the length of the dissecting tool in the photograph (1mk)

(ii) Calculate the magnification of the photograph (2mk)