GATUNDU SUB-COUNTY

FORM FOUR 2016 EVALUATION EXAMINATION

231/1

BIOLOGY

PAPER 1

(Theory)

JULY/AUGUST 2016

SECTION A:

1. A scientific space craft brought some material to earth from the outer space. Explain how one would establish if the material is living or non-living. 2mks

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2. State two functions of golgi apparatus. 2mks

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3. A student observed a row of 16 epidermal cells in a microscopic field that was 8mm in diameter. Calculate the average length of each cell in micrometers. 1mk

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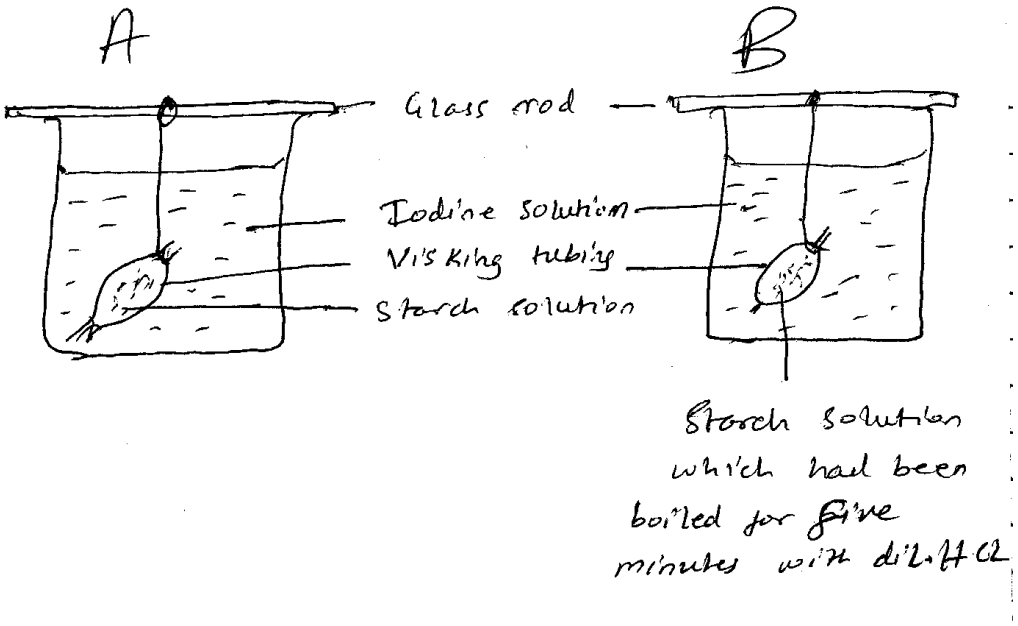
4. A group of students set up an experiment as shown below. The experimental set up were left for 20 minutes.



The observation after 20 minutes were as shown in thetable below.

Set up	Observations	
	Inside tubing	Outside tubing
A	Blue black colour	Colour of liodine.
B	Colour of iodine	Colour of iodine

(a) State the process being demonstrated in this experiment. 1mks

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(b) Explain the results in set up A. 3mks

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5. In a tabulated form, distinguish between class gymnospermae and angiospermae. 2mks

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6. (a) Explain what happens when two species occupy the same habitat. 1mk

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(b) State an adaptation of submerged aquatic plants to gaseous exchange. 1mk

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7. (a) Explain why the number of predators in any ecosystem is less than the number of their prey. 2mks

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(b) Define the term trophic level as used in ecology. (1 Mk)

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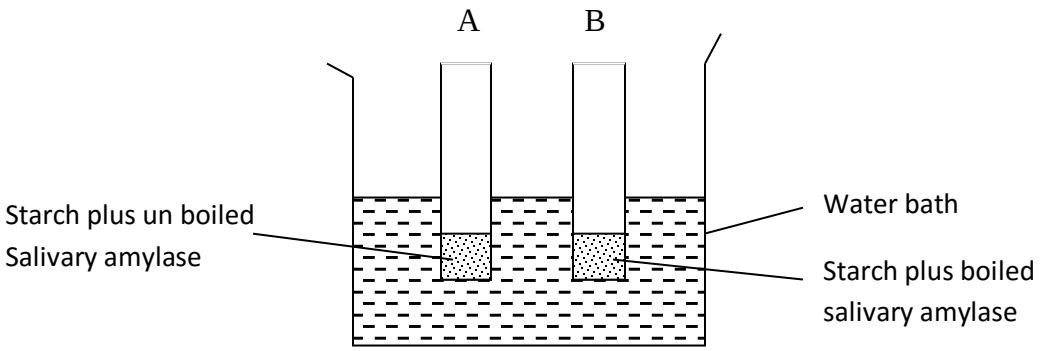
8. In an experiment to investigate an aspect of digestion, two test tubes A and B were set up as shown in the diagram below.



The test tubes were left in the water bath maintained at 37oC for 30 minutes. The content ofeach test tube was then tested for starch.

(a) What was the aim of the experiment? 1mk

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(b) Why was the set up left at 37°C? 1mk

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9. (a) State the function of co-factors in cell metabolism. 1mk

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(b) Give an example of a metallic co-factor. 1mk

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_____

(c) State one function of incisors in herbivores. 1mk

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_____

10. Explain how the following factors affect the rate of photosynthesis:- 2mks

(i) temperature.

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(ii) Concentration of carbon (iv) oxide.

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11. (a) What is metamorphosis? 1mk

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(b) State one advantage of metamorphosis to the life of insects. 1mk

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12. (a) Give any two characteristics of meristematic cells. 2mks

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(b)Explain the function of epicotyl during seed germination. 1mk

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13. (a) Explain how the following prevent self-pollination:- 2mks

(i) Dioecism.-

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_____

_____

(ii) Self-sterility.

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_____

(b)What is the role of pollen tube in plant fertilization? 1mk

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_____

14 (a) The diploid number of chromosomes in a guinea fowl is 60. How many chromatids does it have at the end of mitosis? 1mk

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_____

(b) Suggest the advantages of internal fertilization and development. 2mks

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(c) State three characteristics of fungi. 2mks

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(d) Name the phylum whose members possess a notochord. 1mk

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15. (a) State two causes of variation. 2mks

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(b) Describe one difference between telophase II and

(i) Telophase I of meiosis. 1mk

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_____

(ii) Telophase of mitosis. 1mk

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16. The chemical equation below represents a reaction that occurs in cells.

$2C_{57}H_{98}O_6 + 145O_2 \longrightarrow 102CO_2 + 98H_2O$.

(i) Calculate the respiratory quotient (RQ). 2mks

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_____

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(ii) Identify the substrate used in respiration. 1mk

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(iii) Name the compound that stores energy released during oxidation of glucose. 1mk

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_____

17. (i) Distinguish between convergent and divergent evolution. 2mks

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(ii) Give one method by which the age of fossils can be determined. 1mk

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18. The following statement represents a type of gene mutation.

	Intended message.	Actual message
(i)	Eat the meat	Heat the meat
(ii)	This is my team	This is my tea.

(a) Identify the type of gene mutation illustrated in I and II above.

(i) _____ 1mk

(ii) _____ 1mk

(b) Name two examples of chromosomal mutation that lead to change in chromosomal structure. 2mks

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19. Give one factor that influences:-

(a) Capillarity. 1mk

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(b) Root pressure. 1mk

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(c) State the role of companion cells during transport in phloem tissue. 1mk

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20. Explain the meaning of the following terms:-

(a) Reception. 1mk

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(b) Co-ordination. 1mk

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21. Give the name of the following responses.

(i) curvature of plant shoot towards light. 1mk

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(ii) coiling of a plant shoot round a supporting structure. 1mk

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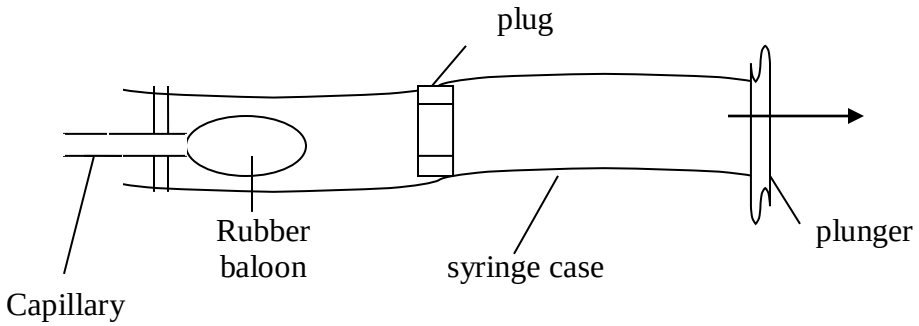
22. The apparatus below illustrate breathing in a mammal.



(a) Describe what happens if the rubber plug is pulled in the direction shown by the arrow. 1mk

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(b) Give the parts of mammal represented by:-

(i) Capillarity tube. 1mk

_____

(ii) Rubber plug. 1mk

_____

23. (a) Name two bones that form the pectoral girdle. 2mks

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(b) Name the cavity formed by the scapula that form a joint with the humerous. 1mk

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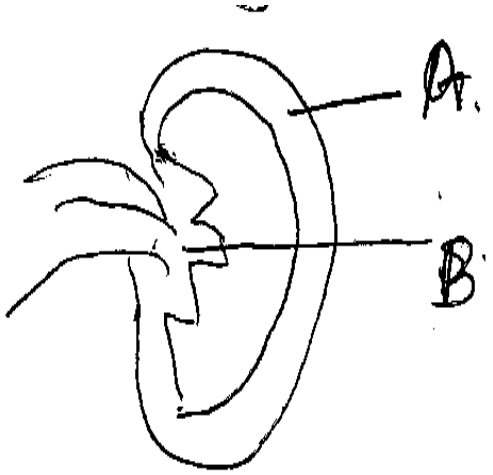
24. Study the following diagram showing longitudinal section of a kidney.



Name the parts labeled A and B. 2mks

A:_____

B:_____

25. Name the blood vessel that supplies blood to:-

(i) Heart muscles. 1mk

_____

(iii) Kidney. 1mk

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Explain why it is not advisable to sleep in a room with burning charcoal stove. 2mks

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26. Name the part of the ear involved in:

(a) Balance.

_____

(b) Amplification of sound waves.

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(c) Reception of sound stimulus. 3mks

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27. What is Homeostasis? 1mk

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Explain what happens to excess amino acids in the liver of humans. 3mks

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28. State one use of each of the following excretory products of plants.

(i) Tannin. 1mk

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(ii) Latex. 1mk

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