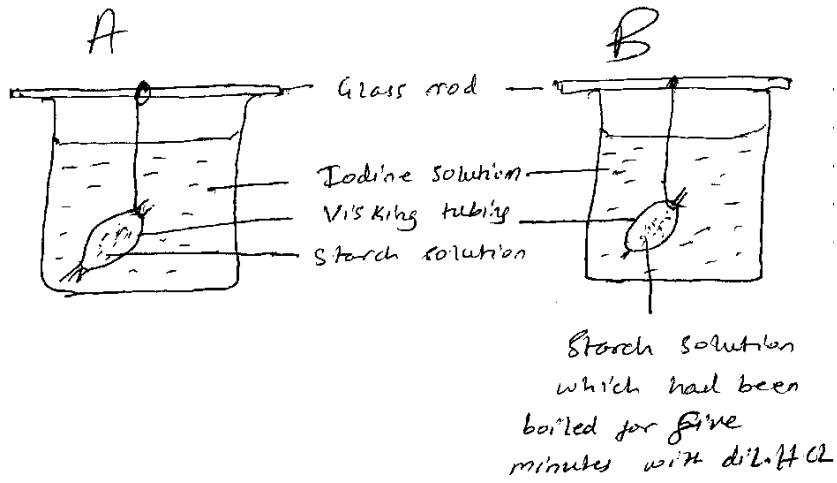
GATUNDU SUB-COUNTY
FORM FOUR 2016 EVALUATION EXAMINATIONS
231/1
BIOLOGY
PAPER 1
(Theory)
JULY/AUGUST 2016

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
2. State two functions of golgi apparatus. 2mks
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
4. A group of students set up an experiment as shown below. The experimental set up were left for 20 minutes.

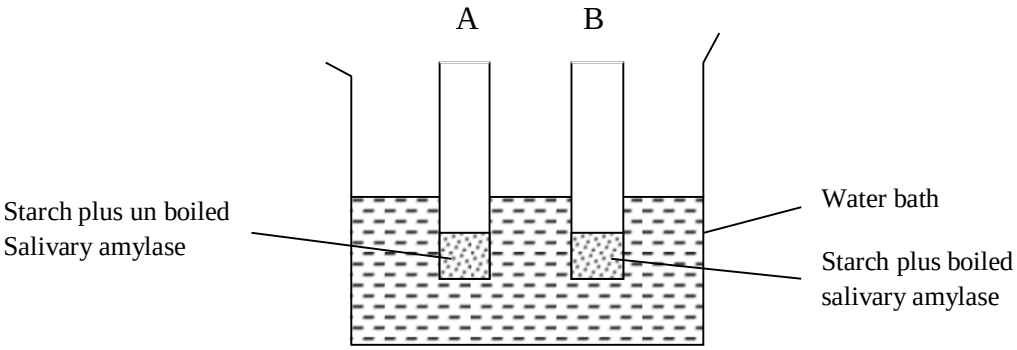


The observation after 20 minutes were as shown in thetable below.

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

5. In a tabulated form, distinguish between class gymnospermae and angiospermae. 2mks
6. (a) Explain what happens when two species occupy the same habitat. 1mk
   (b) State an adaptation of submerged aquatic plants to gaseous exchange. 1mk
7. (a) Explain why the number of predators in any ecosystem is less than the number of their prey. 2mks
   (b) Define the term trophic level as used in ecology. (1mk)
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 of each test tube was then tested for starch.

(a) What was the aim of the experiment? 1mk
(b) Why was the set up left at $37^{o}C$? 1mk

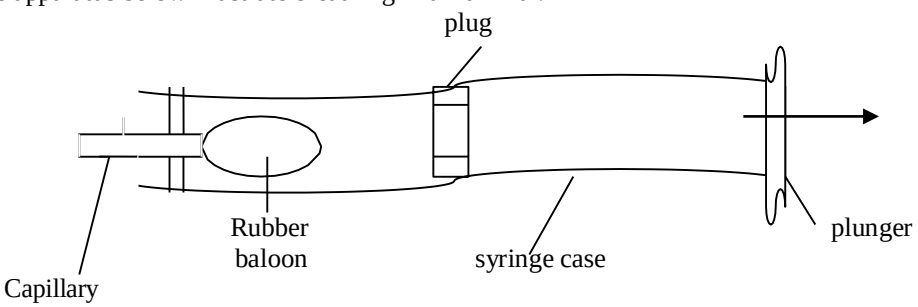
9. (a) State the function of co-factors in cell metabolism. 1mk
   (b) Give an example of a metallic co-factor. 1mk

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

10. Explain how the following factors affect the rate of photosynthesis:- 2mks
    (i) temperature.
    (ii) Concentration of carbon (iv) oxide.
11. (a) What is metamorphosis? 1mk
    (b) State one advantage of metamorphosis to the life of insects. 1mk
12. (a) Give any two characteristics of meristematic cells. 2mks
    (b) Explain the function of epicotyl during seed germination. 1mk
13. (a) Explain how the following prevent self-pollination:- 2mks
    (i) Dioecism.
    (ii) Self-sterility.
    (b) What is the role of pollen tube in plant fertilization? 1mk
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
    (b) Suggest the advantages of internal fertilization and development. 2mks
    (c) State three characteristics of fungi. 2mks
    (d) Name the phylum whose members possess a notochord. 1mk
15. (a) State two causes of variation. 2mks
    (b) Describe one difference between telophase II and
    (i) Telophase I of meiosis. 1mk
    (ii) Telophase of mitosis. 1mk
16. The chemical equation below represents a reaction that occurs in cells.
    $2C_{57}H_{98}O_6 + 145O_2 \rightarrow 102CO_2 + 98H_2O$.
    (i) Calculate the respiratory quotient (RQ). 2mks
    (ii) Identify the substrate used in respiration. 1mk
    (iii) Name the compound that stores energy released during oxidation of glucose. 1mk
17. (i) Distinguish between convergent and divergent evolution. 2mks
    (ii) Give one method by which the age of fossils can be determined. 1mk
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.
    (b) Name two examples of chromosomal mutation that lead to change in chromosomal structure. 2mks
19. Give one factor that influences:-
    (a) Capillarity. 1mk
    (b) Root pressure. 1mk
    (c) State the role of companion cells during transport in phloem tissue. 1mk
20. Explain the meaning of the following terms:-
    (a) Reception. 1mk
    (b) Co-ordination. 1mk
21. Give the name of the following responses.
    (i) curvature of plant shoot towards light. 1mk
    (ii) coiling of a plant shoot round a supporting structure. 1mk
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
(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
(b) Name the cavity formed by the scapula that form a joint with the humerous.

1mk

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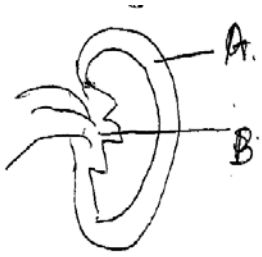
24. Study the following diagram showing longitudinal section of a kidney.



Name the parts labeled A and B. 2mks

25. Name the blood vessel that supplies blood to:-
(i) Heart muscles. 1mk
(ii) Kidney. 1mk
Explain why it is not advisable to sleep in a room with burning charcoal stove.

2mks

26. Name the part of the ear involved in:
(a) Balance.
(b) Amplification of sound waves.
(c) Reception of sound stimulus.
3mks

27. What is Homeostasis?

1mk
Explain what happens to excess amino acids in the liver of humans.

3mks

28. State one use of each of the following excretory products of plants.
(i) Tannin.
1mk
(ii) Latex.
1mk

GATUNDU SUB-COUNTY FORM FOUR 2016 EVALUATION EXAMINATIONS
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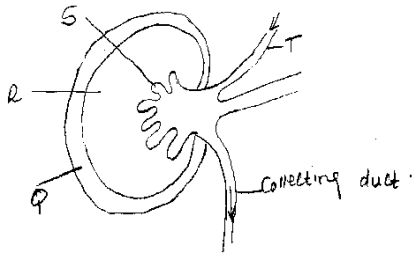
BIOLOGY
PAPER 2
(Theory)
JULY/AUGUST 2016

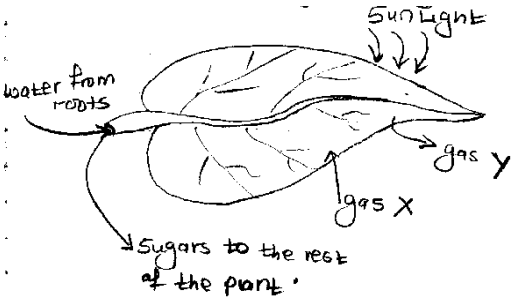
1. The diagram below is a longitudinal section of an organ in mammals.



(a) Name the organ. 1mk
(b) Identify the parts R and S
(c) (i) State two differences in the structure above found in the desert rat and fish. 2mks
(ii) Account for the difference stated above. 2mks
(d) Name the gland associated with the secretion of aldosterone hormone. 1mk

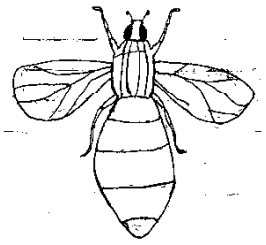
2. A family with four children, three were found to have normal skin pigmentation while one was albino. Using letter „A" to represent gene for normal skin pigmentation and „a" to represent the gene for albinism.
(a) What are the genotypes of the parents? 2mks
(b) Work out the genotypes of the normal pigmented children and the albino child. 5mks
(c) What is the probability that the fifth child will be an albino. 1mk

3. The following diagram of a leaf shows what happens in a plant leaf during photosynthesis.



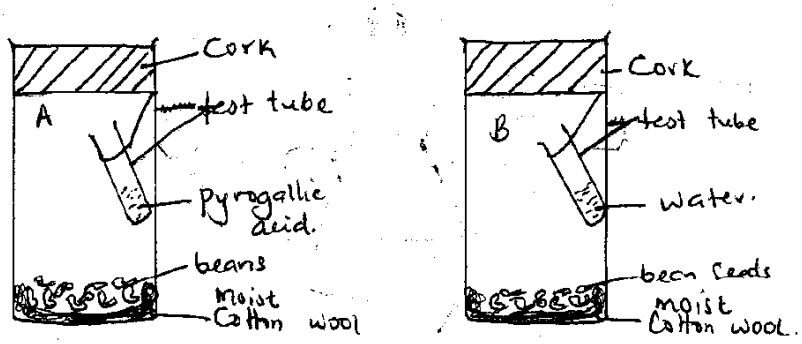
(a) State two ways in which leaves are adapted to absorb light. 2mks
(b) Name the gases labeled x and y.
(c) Name the tissues that transports:- 2mks
(i) Water into the leaf.
(ii) Sugar to other parts of the plant.
(d) Explain why it is an advantage for the plant to store carbohydrates as starch rather than as sugars. 2mks

4. Study the diagram of the organism shown below then answer the questions that follow.



(a) State the phylum to which the organism belongs. 1mk
(b) With reasons state the class to which the organism belongs:-
Class 1mk
Reasons: 3mks
(c) Name two human diseases of which the organism is a vector. 2mks
(d) What type of metamorphosis does the organism show? 1mk

5. In an experiment a group of students set up the test tubes as shown below.



(a) What was the aim of the experiment? 1mk
(b) Why was the pyrogallic acid included in the gas jar A? 1mk
(c) What results would you expect in each of the gas jar A and B at the end of the experiment? 2mks
(d) State three artificial ways of breaking seed dormancy. 3mks
(e) Name two hormones that bring about rapid cell division in plants. 2mks

SECTION B: 40mks

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

6. In an investigation, two persons A and B took the same amount of a meal rich in carbohydrates. Their blood sugar levels were immediately determined and thereafter at intervals. The results were as shown in the table below.

Time (minutes)	Glucose level in blood (mg/100cm^3)	
	Person A	Person B
0	92	80
15	90	76
30	105	90
40	116	105
60	140	162
80	138	210
120	100	202
135	96	194
160	90	180
180	90	162

(a) On the grid provided, plot graphs of glucose level in blood against time on the same axis. 7mks
(b) (i) When was the glucose level of person A equal to that of person B. 1mk
(ii) What was the concentration of glucose in the blood of A and B at the 20th minute? 2mks
(c) (i) Account for the blood sugar level in person A and person B between O and 15. 2mks
In man, the normal blood sugar level is about 90mg/100cm^3 of blood. Explain the change in the blood sugar level in person A between 15 and 60 minutes. 4mks
(d) (i) Suggest a possible reason for the high blood sugar level in person B. 2mks
(ii) How can the high sugar level in person B be controlled? 1mk
(e) Name the compound that stores energy released during oxidation of glucose. 1mk

7. (a) Describe the way by which terrestrial plants are adapted to living in arid and semi-arid ecosystems. 10mks
(b) Explain how various human activities cause soil pollution. 10mks

8. (a) Define:=
(i) Chemical evolution. 2mks
(ii) Organic evolution. 2mks
(iii) Giving examples give and account for any five pieces of evidence for organic evolution. 16mks

GATUNDU SUB-COUNTY FORM FOUR 2016 EVALUATION EXAMINATIONS
BIOLOGY
PAPER 3
2016 MOCK
CONFIDENTIAL

1. All the photographs should be colored
2. To make solution M mix thee egg yolks and 100g of sucrose with 500 mls of distilled water
3. Each student should have……three test tubes
   Access to DCPIP
   Sodium bicarbonate
   Benedicts solution
   Dilute Hcl
   Source of heat
   Sodium hydroxide
   Copper sulphate

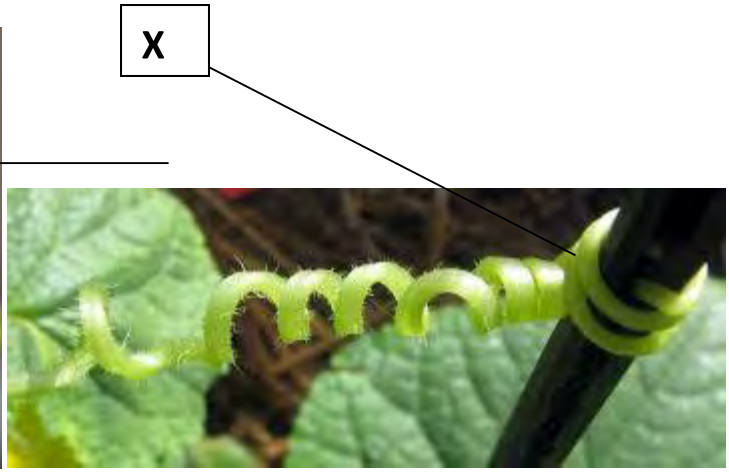
GATUNDU SUB COUNTY FORM 4 2016 EVALUATION EXAM
231/3
BIOLOGY
PRACTICAL

1. (i) Examine photograph k 1and K2 then answer the questions that follow.

K1

K2

R1



R2

(a) Name the response that is exhibited by the seedlings. 1mrk.
(b) Explain how the response you have stated in (a) above occurs. 6mrks
(c) What is the significance (survival value) of the response you have stated in (a) above. 1 mrk.

(ii) Photographs R1 and R2 show a certain response in plants.
   a) Name the response shown by plant X. 1 mrk
   b) Explain how the response you have stated In (a) above occurs. (3mks)
   c) What is the biological significance of the response shown by X? (3 mks)

2 (a).Identify organs B and D in photograph T2 and state the class of organism from which they were obtained(4mks)

T1 **T2**

(b) State the common function of the organs identified in (a) above.

(1mk)

(c) Name the parts of the body where B and D in photograph T2 are found

(2mks)

(d) List the adaptations of D to its functions

(3mks)

(e) Using observable features only, state how B is adapted to its function

(2mks)

3. You are provided with solution M and various reagents. Use them to carry out food tests.

(13mks)

TEST	PROCEDURE	OBSERVATION	CONCLUSION