GATUNDU SUB-COUNTY

FORM FOUR 2016 EVALUATION EXAMINATION

231/2

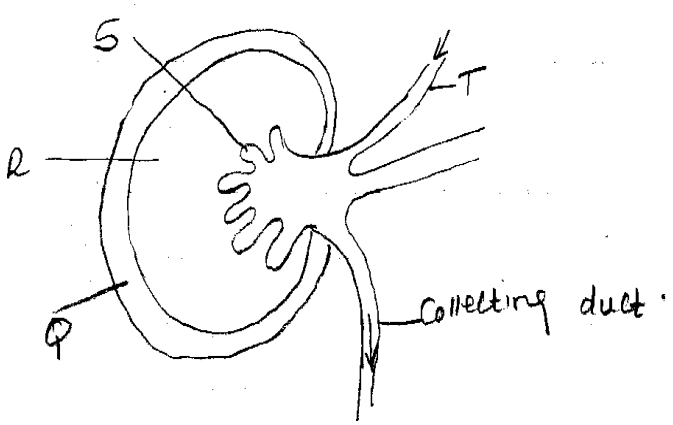
BIOLOGY

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

R _____

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

_____

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_____

(d) Name the gland associated with the secretion of aldosterone hormone. 1mk

_____

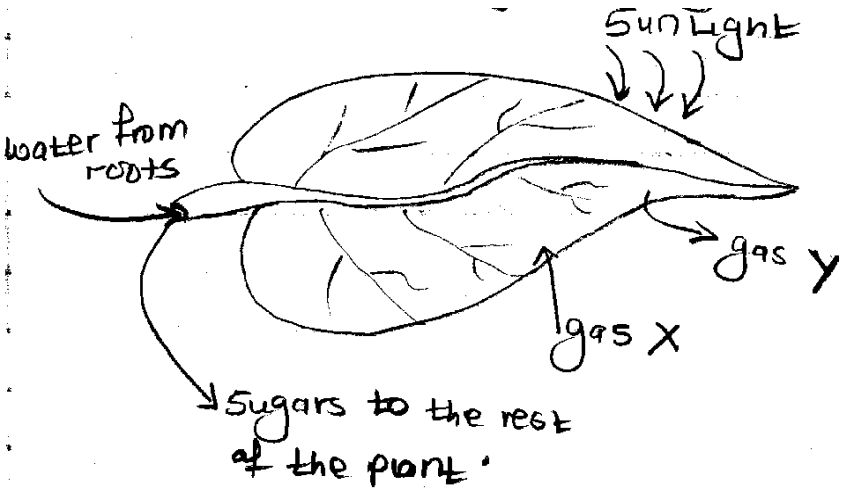
2. A family with four children, three were found to have normal skin pigmentation while one was albino. Using letter 'A' to represent gene for normal skin pigmentation and 'a' to represent the gene for albinism.

(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.

X_____

Y_____

(c) Name the tissues that transports:- 2mks

(i) Water into the leaf.

_____

_____

_____

(ii) Sugar to other parts of the plant.

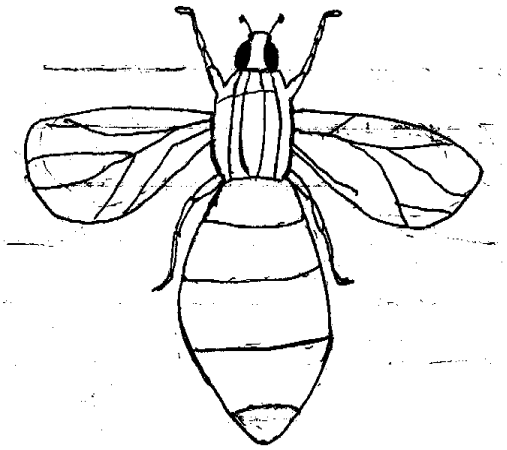
_____

_____

_____

(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

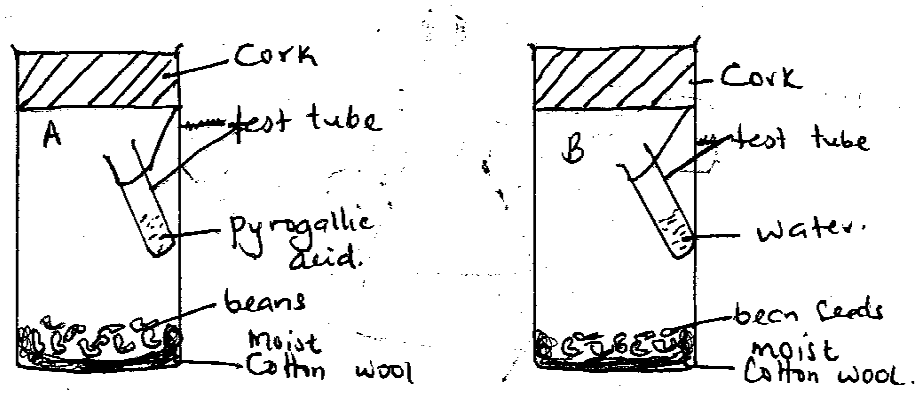
_____

_____

_____

_____

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

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_____

_____

(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

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_____

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_____

_____

(e) Name two hormones that bring about rapid cell division in plants. 2mks

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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 20^{th} minute? 2mks

_____

_____

_____

_____

_____

(c) (i) Account for the blood sugar level in person A and person B between O and 15. 2mks

_____

_____

_____

(ii) 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

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(d) (i) Suggest a possible reason for the high blood sugar level in person B. 2mks

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_____

(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