THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

033/2

BIOLOGY 2
ALTENATIVE TO PRACTICAL
(For Both School and Private Candidates)

Time: 2:30 Hours **Friday, 07th November 2014 a.m.**

Instructions

1. This paper consists of **five (5)** questions. Answer **all** questions.
2. Each question carries 10 marks.
3. Except for diagrams which must be drawn in pencil, all writings should be in blue or black ink.
4. Calculators and cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

1. A form two biology teacher was teaching a topic on plant nutrition. He went to the garden and pick up a leaf with network veins.

(a) (i) Draw a well labeled diagram of the leaf that the teacher picked up.

(ii) State the role played by each part of the leaf labeled in 1 (a) (i) above.

(b) What is the general function of the leaf?

(c) List two raw materials and two conditions necessary for the leaf to carry out the function you mentioned in 1(b) above.

2. A biologist collected data from an athlete after a period of running. The following table shows his data.

Running time (in minutes)	Concentration of lactic acid in blood (mg/ 100cm^3)
0	3
2	10
4	28
6	45
8	50
10	44
12	40
14	36
16	33
18	30
20	26
30	12
40	8
50	5
60	3
65	3

(a) (i) Draw a graph of a concentration of lactic acid against running time by using the data given .

(ii) Which period on the graph shows the period of recovery?

(b) (i) Name the process which led to the production of lactic acid in the body of the athlete?

(ii) Define the process named in (b) (i) above.

(iii) Which tissue was responsible for the production of the lactic acid?

(iv) State one effect of the excessive accumulation of lactic acid in the body.

(c) Describe five factors which affect the rate of respiration.

3. (a) Draw a well labeled diagram of a half longitudinal section of hibiscus flower.

(b) What is the mode of pollination shown by the flower? Give three reasons.

In an experiment, $5cm^3$ of starch solution was placed in each of 4 test tubes labeled A, B, C and D. The contents of the test tubes were maintained at 37 °C but varied as shown in the table below.

Test tube	Contents
A	$5cm^3$ of starch + 2 cm^3 of saliva and few drops of dilute hydrochloric acid.
B	$5cm^3$ of starch and few drops of dilute hydrochloric acid.
C	$5cm^3$ of starch + 2 cm^3 of saliva and few drops of sodium carbonate.
D	$5cm^3$ of starch.

After 20 minutes, $2cm^3$ of the content from test tube C was taken into a test tube and tested using Benedict's solution.

(a) (i) What was the aim of the experiment?
(ii) Explain the changes which occurred in each test tube shown in the table above.

(b) Explain the changes observed after adding Benedict's solution and boiling the content from the test tube C.

You are provided with a list of seven different organisms named butterfly, fish, owl, bat, rat, honey bee and lizard. Answer the following questions:

(a) (i) Identify four organisms from the list which show the same mode of locomotion.
(ii) Name the mode of locomotion shown by organisms mentioned in (a) (i) above.

(b) For each organism listed in the table below, name structure(s) that they use for locomotion. Present your answer as shown in the table below.

S/n	Organism	Structure(s) used for movement
1	Butterfly	
2	Lizard	
3	Bat	
4	Rat	
5	Honey bee	
6	Fish	

(c) State three importance of movement in animals.