NAME………………………………………………………….ADM NO………………………

SCHOOL…………………………………………………….. DATE……………………………

 SIGN…………………………….

BIOLOGY

COMBINED PAPER

(Theory)

JULY/AUGUST 2016

TIME: 2 HOURS

**TOP EVALUATION EXAMINATIONS 2016**

***FORM 2 PAPER***

**INSTRUCTIONS TO CANDIDATES**

1. Write your name and admission number in the spaces provided above
2. Sign and write the date of examination in the spaces provided above
3. Answer all questions
4. Answers must be written in the spaces provided in the question paper
5. This question paper has 8 printed pages.
6. Students should check the question paper to ascertain that all the pages are printed as indicated and that not questions are missing
7. Students should answer the questions in English.

**FOR EXAMINER’S USE ONLY**

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| Question | Maximum score | Student’s Score |
| **1-24** | **80** |  |

1. State three importance of studying Biology. (3 marks)

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1. State the functions of the following organelles.

a) Lysosomes (1mark)

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b)Golgi apparatus (1 mark)

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1. Study the cell organelle below and then answer questions that follow.



1. Identify the organelle. (1 mark)

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1. Name the parts labeled: (4 marks)

A: *……………………………………………………………………………………………………………..*

*B: …………………………………………………………………………………………………………….*

*C: …………………………………………………………………………………………………………….*

*D: …………………………………………………………………………………………………………….*

1. (a) What is Taxonomy ? (1 mark)

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(b)Name any three taxonomic groups in plants. (3 marks)

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1. List the external features used to classify animals. (2 marks)

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1. (a) State one principle followed during binomial nomenclature. (1 mark)

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1. Give the advantages of using binomial nomenclature . (2 marks)

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1. Give two differences between osmosis and diffusion. (2 marks)

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1. Give the reasons for each of the following steps when preparing a cross-section of a stem or leaf for examination under the microscope. (3 marks)
2. cutting very thin sections

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1. Placing sections in water

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1. Staining the sections with iodine before observing.

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1. Explain the meaning of each of the following. (3 marks)
2. Tissue

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1. Organ

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1. Organ system

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1. Name the structures which are present in animal cells but absent in plant cells. (2 marks)

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1. A group of form 1 students set up an experiment to investigate a certain physiological process. The set up is as shown in the diagram below.

After some time they observed that the level of sugar had risen.

1. What was the physiological process under investigation? (1 mark)

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1. Why was there a rise in the level of sugar solution? (2 marks)

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1. Suggest the results that the students would obtain if they repeated the experiment using cooked potato. (1 mark)

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1. Give a reason for your suggestion in (c) above? (2 marks)

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1. Give the roles of physiological process in (a) above in living organisms. (3 marks)

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1. Name two salts in bile that aid in emulsification of fats. (2marks)

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1. The experiment that follows was done to investigate the effect of light intensity on the rate a certain process. Use it to answer questions after it.

 **Apparatus and Materials**

* lamp e.g. 60 W
* Ruler
* Stop watch
* 400 cm3 beaker as water bath/heat filter
* Thermometer
* Test tube containing dilute sodium hydrogencarbonate solution
* Pondweed



**Procedure**

1. Cut the stem of a bubbling pond weed which has been well illuminated to about 5cm. Place the cut surface upwards in a test tube containing sodium hydrogen carbonate solution.
2. Place the test tube in the beaker of water and note the temperature. The beaker of water acts as a heat filter or heat shield, so its temperature should be checked at intervals to ensure that it is constant throughout the experiment; the water should be renewed if necessary.
4. Darken the laboratory by turning off as many lights as possible.

5. Place lamp 10 cm away from  the beaker. Allow the plant to equilibrate or adjust to the light intensity for 2-3 minutes
When the rate of air bubbles is regular and a adequate (>10 bubbles/minute), place the capillary tube/test tube over the cut tip of the pondweed  and then measure the volume. OR, count the number of bubbles. This should be done for  5 minutes. Repeat twice and obtain an average of the results.
6. Repeat steps 4 and 5, with increasing distances away from the light source e.g. 20 cm, 30 cm, 40 cm and 50 cm. Light intensity is a inversely proportional to  the square of the distance, so as the distance is increased the light intensity decreases.  Note that doubling the distance does not half the intensity, rather quarters it.
7. Record results in a table, then plot a graph of volume of oxygen/minute OR number of bubble/minute against the distance between the lamp and the plant.

Questions

1. Identify the process under investigation. (1 mark)

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1. Explain what happens when the distance between the lamp and the plant decreases. (1 mark)

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1. Why is sodium hydrogen carbonate solution used instead of water? (2 marks)
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2. Why was the laboratory darkened? (2 marks)

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1. How can we prove that oxygen was the gas produced? (2 marks)

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1. What is the relationship between the light intensity and the rate of the process under investigation at low light intensities? (2 marks)

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1. *I*dentify two factors that may not limit the above experiment. (2 marks)

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1. State the importance of the process under investigation. (2 marks)

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1. (a) Name the two types of lipids. (2 marks)

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1. Identify the building blocks of lipids? (2 marks)

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1. State the properties of enzymes. (3 marks)

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1. Mention the factors that affect enzyme action. (3 marks)

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1. State the similarities between a dicotyledonous and monocotyledonous root. (2 marks)

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1. What are the advantages of the closed circulatory system over open circulatory system? (2 marks)

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1. Give the reasons why pressure of blood is greater in the arterioles than I the veins of mammals.

 (2 marks)

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1. Explain why blood flowing in blood vessels does not normally clot. (1 mark)

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1. Name the structures used for gaseous exchange by plants. (2 marks)

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1. Name the theories suggesting the mechanism of opening and closing of stomata. (2 marks)

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1. Under what conditions would blood transfusion be necessary in people? (2 marks)

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1. State the role of blood clotting on wounds. (3 marks)

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