Name's of student……

School Name……

BIOLOGY PAPER II

P530/2

SENIOR SIX

MARCH

COMPREHENSIVE BIOLOGY TRANSFORMATION INITIATIVE.

UACE

S.6 CANDIDATES- 2024

TOPICS: Transport, Ecology, variation and Inheritance, chemicals of life, movement in and out of cells, gas exchange and nutrition.

PAPER 2

2 HOURS AND 30 MINUTES

INSTRUCTIONS TO THE CANDIDATES:

This paper consists of section A and B.

Answer question one in section A plus 3 questions in section B

Candidates are advised to read questions carefully, organize their answers and present them precisely and logically, illustrating with well labelled diagram wherever necessary.

N.B – QUESTION ONE IS COMPULSORY TO ALL CANDIDATES.

1. **Fig 1.0.0-Tufted ducks** (Aythya fuligula) are found in Lake Victoria. They eat molluscs, insects and plants, sometimes from the surface but mostly by diving under the water. The graph shows how the heart rate of a tufted duck changes when diving under the water.

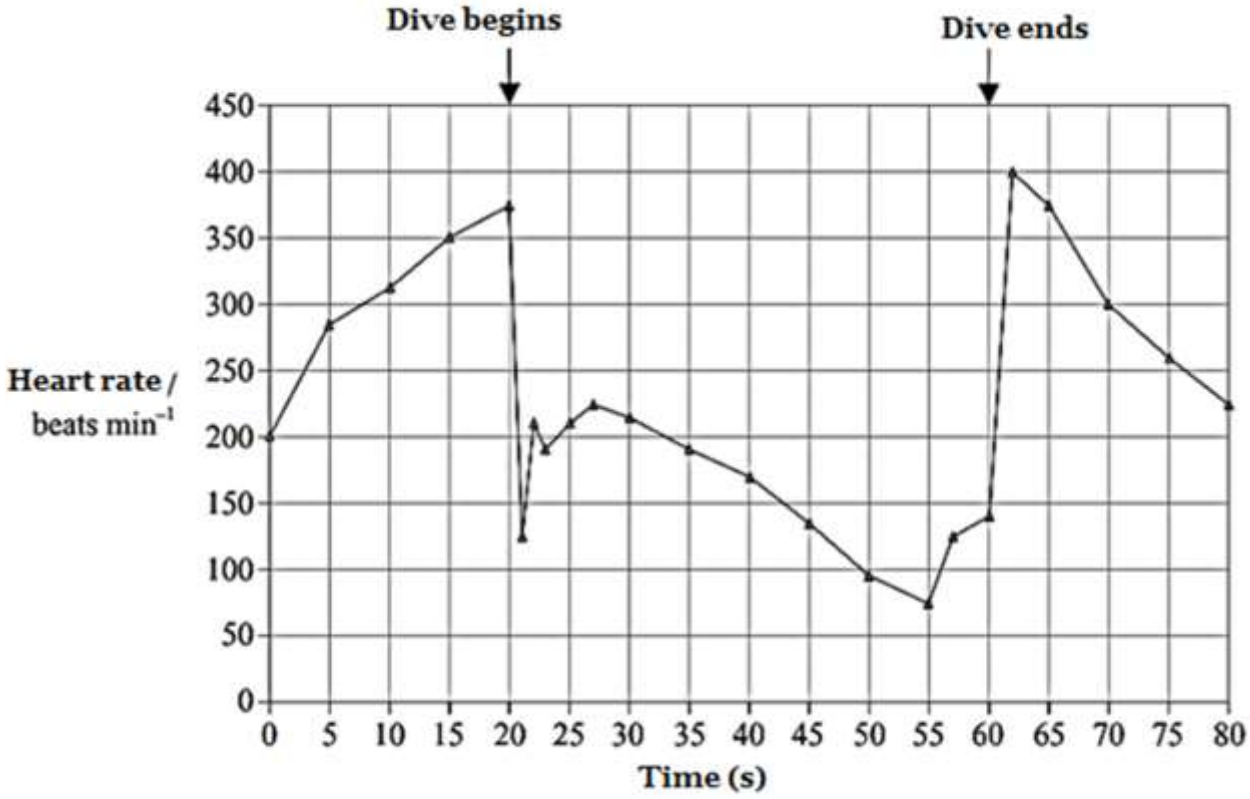

Fig 1.0.0

Fig 2.0.0- shows the variation of the blood supply to different parts of the tufted duck according to whether it is swimming at normal speed or maximum speed.

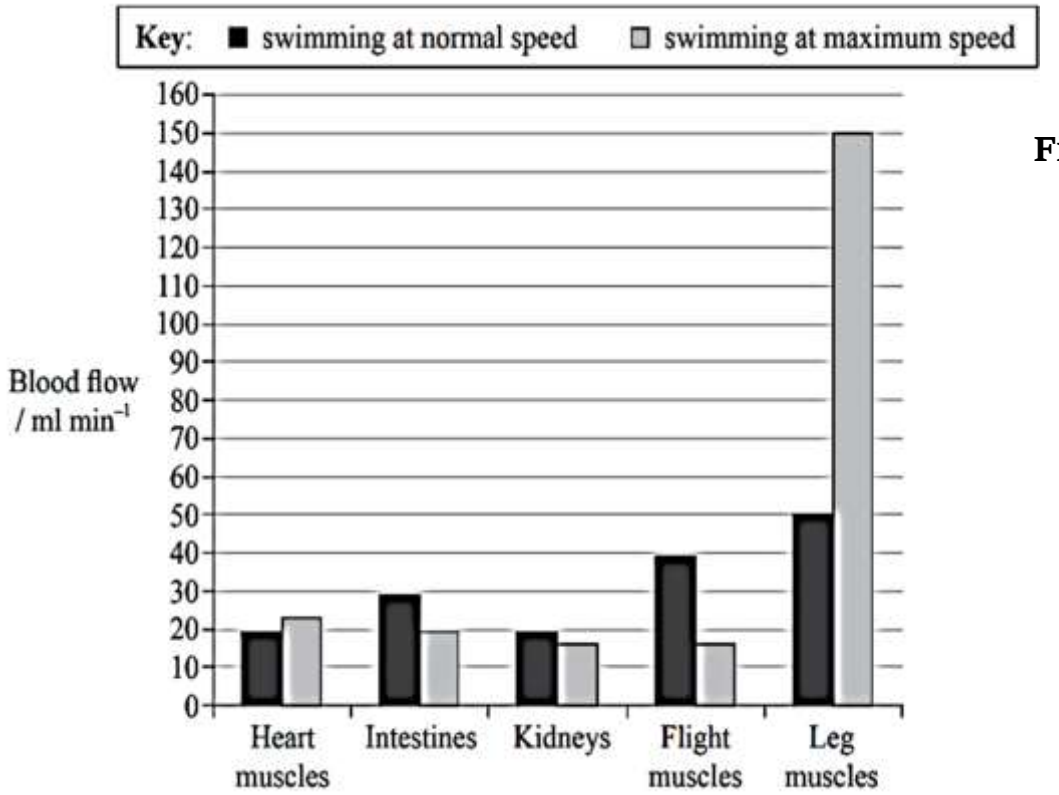

Fig 2.0.0

a) From **Fig 1.0.0.**

(i) Describe the changes in the heart rate during the dive. (05 marks)

(ii) Account for the changes in the heart rate during the dive. (07 marks)

(iii) Account for the heart rate before and after the dive. (05 marks)

b) (i) Explain the adaptations of diving animals to longer submersions in water. (07 marks)

c) Suggest explanations for the following observations.

(i) With reasons, the type of respiration used by the tufted duck during the dive. (02 marks)

(ii) With reasons, the colour of the **Leg** muscles. (03 marks)

d) From **Fig 2.0.0.**

(i) Compare the blood flow to the heart muscles with the blood flow to the flight muscles when changing from swimming at normal speed to swimming at maximum speed. (02 marks)

(ii) Calculate the percentage increase in blood flow to the leg muscles when the tufted duck changes from swimming at normal speed to swimming at maximum speed. (02 marks)

(iii) Explain the changes in blood flow that occur when swimming at maximum speed. (05 marks)

(iv) Predict, with reference to both graphs, what would happen to the blood flow to the heart muscles when the tufted duck is diving. (02 marks)

SECTION B (60 MARKS)

CHOOSE THREE QUESTIONS FROM THIS SECTION.

2a)(i) Explain the significance of the distribution of **tissues** in the respiratory system of human beings. (15 marks)

(ii)Suggest why smokers get **more infections** of the respiratory system than non-smokers? (05 marks)

3a)(i) Explain the **genetic basis** of continuous and discontinuous variation. (05 marks)

(ii) Describe the different mechanisms that cause **variations** in populations. (07 marks)

b) Explain how **adaptive radiation** results into **genetic diversity** in populations. (08 marks)

4a) Describe evidences that show **photosynthesis** has both the light and dark stage. (10 marks)

b) Explain the different **Holozoic** feeding strategies in animals. (10 marks)

5a) what is meant by **ecological succession**? (03 marks)

b) Explain why

(i) **Efficiency** in the transfer of energy between primary producers to primary consumers and from herbivores to carnivores vary. (10 marks)

(ii) Nitrification and denitrification occur in different soil aeration conditions. (07 marks)

6a) Describe the **structural** adaptations of the following Bio-molecules to their role.

(i) Starch. (05 marks)

(ii) Cellulose. (05 marks)

b)(i) Describe the functioning of **Biological pumps** in transport of polar molecules across the cell membrane. (05 marks)

(ii) Explain the significance of the **phospholipid bi-layer** in the cell membrane. (05 marks)

END

Contributions made by Mugwe Martin

CC- comprehensive Biology transformation Initiative.

Transforming Biology Pedagogy.