P530/2

BIOLOGY

PAPER 2

2½ hours

Apr 2023

Uganda Advanced Certificate of Education

BIOLOGY DEPARTMENT – 2023

SET SIX

PAPER 2

THEORY

2 hours 30 minutes.

INSTRUCTIONS TO CANDIDATES:

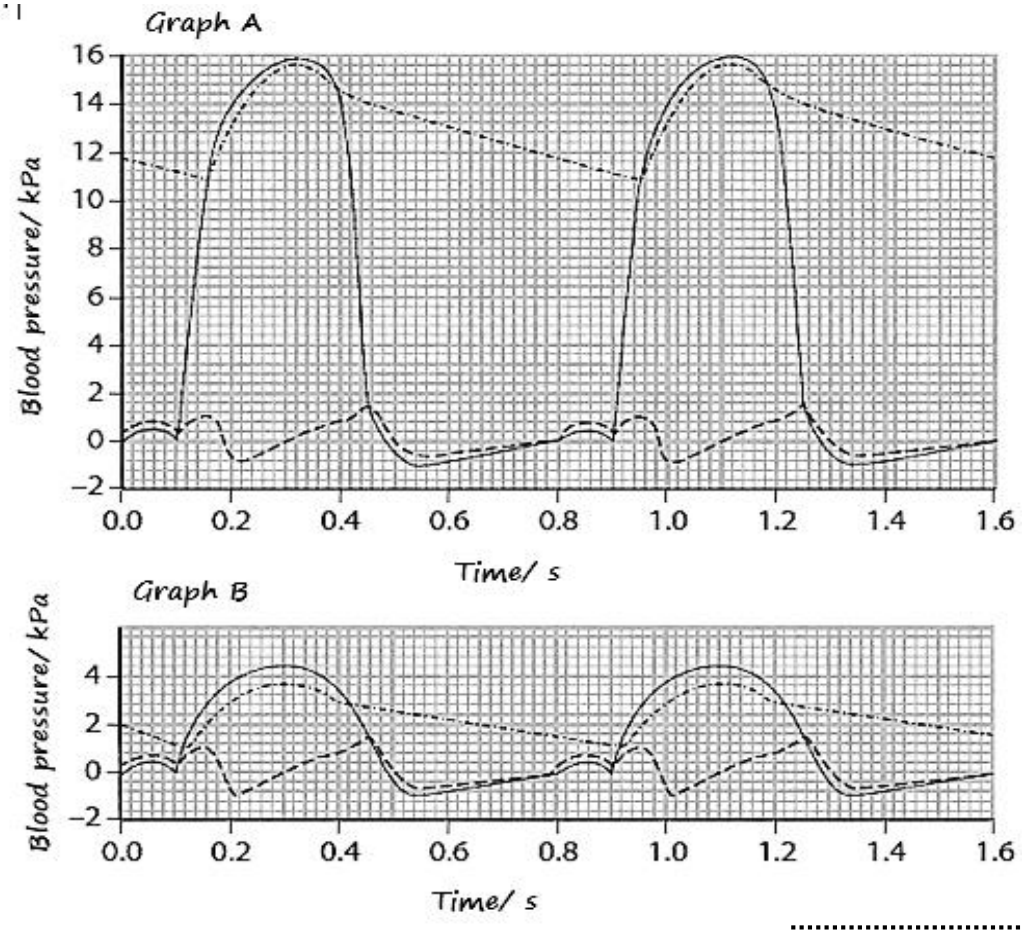
- ✓ Answer question one in section **A** plus three others from section **B**.
- ✓ Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically, illustrating with well labeled diagrams where ever necessary.
- ✓ Write on the answer sheet, your name, index number and the questions attempted in their order as shown in the table.

QUESTION	MARKS
TOTAL	

SECTION A: (40 Marks)

Compulsory.

1. The graphs below show pressure changes through the heart. Graph A shows the changes in the blood pressure in one side of the heart. Graph B shows the changes in blood pressure in the other side of the heart over same time period.



Atria **Ventricles** **Blood vessel leaving the heart**

a) Calculate the heart rate in beats per minute. Show your working. **(02marks)**

b) Giving reasons from the graphs, which side of the human heart is represented by Graph A and B. **(05marks)**

c) Using graph A;

(i) Describe the blood pressure changes between 0.0 and 0.45 seconds, **(05marks)**

(ii) Account for the above changes that occur in this part of the cardiac cycle. **(10marks)**

d) How different are blood vessels carrying blood away from heart in graph A and graph B? **(05marks)**

e) Why is the highest pressure reached in the ventricle in graph A is much higher than the pressure reached in the ventricle in graph B. **(03marks)**

f) Account for the effect of increased level of carbon dioxide in blood on blood pressure in man **(10marks)**

SECTION B: (60 Marks)

Attempt only 3 questions from this section.

2. (a) Describe the photosynthetic mechanism which occurs in a C3 plant **(08marks)**
   (b) Explain the effect of temperature on photosynthetic rate of plants. **(07marks)**
   (c) What are the structural adaptations of shade leaves to maximum capture of light? **(06marks)**
3. (a) How is sex determined in humans? **(06marks)**
   (b) A woman has four sons, one of whom is a haemophilia and the three are normal.
   (i) What are the possible genotypes of the woman and her husband? **(08marks)**
   (iii) Is it possible for the couple to have a haemophiliac daughter? Explain your answer. **(06marks)**
4. (a) Describe briefly the range of defenses of a mammal against infection **(12marks)**
   (b) Explain the different modifications of the columnar epithelium to perform their roles in the body of animals. **(08marks)**

5. (a) By what process(se) do new species arise from pre-existing one? **(10marks)**
   (b) Account for the different post-zygotic mechanisms that isolate organisms of different organism. **(10marks)**

6. (a) With suitable examples in each case, describe the photoperiodic categories of flowering plants. **(15marks)**
   (b) Outline the differences between short-day and long-day plants. **(05marks)**

END