P530/2
BIOLOGY
PAPER 2
-2022
2½ HOURS

SENIOR FIVE BIOLOGY EXAMINATION
UGANDA ADVANCED CERTIFICATE OF EDUCATION
BIOLOGY
(THEORY)
PAPER 2
2HOURS AND 30 MINUTES

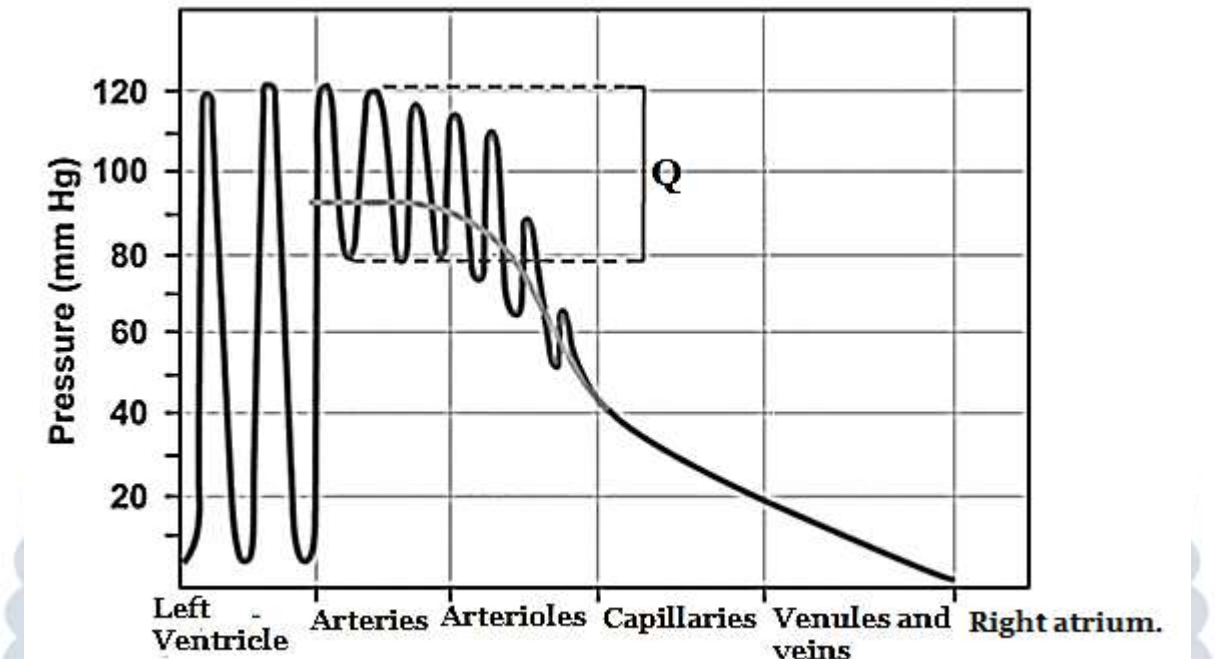
INSTRUCTIONS TO THE STUDENTS:

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 diagrams wherever necessary

SECTION A (40 MARKS)

N.B. QUESTION ONE IS COMPULSORY TO ALL STUDENTS.

1. The Figure below shows Blood pressure changes along the systemic circuit of the typical double circulatory system of a mammal at rest. Study the blood pressure carefully and answer questions that follow.



a) Compare the Blood pressure in the **left ventricle** with **systemic** blood vessels. **(07 marks)**

b) From the figure above, describe the Blood pressure changes in the
(i) **Left ventricle.** **(03 marks)**
(ii) **Along systemic Blood vessels.** **(05 marks)**

c) Explain the blood pressure changes.
(i) **Left ventricle**. **(05 marks)**
(ii) **Along the Systemic Blood vessels.** **(15 marks)**

d) With reasons.
(i) **Identify region Q.** **(03 marks)**
(ii)Predict the pressure that would be found in the right atrium. **(03 marks)**

SECTION B (60 MARKS)

2a) (i) Explain why the relative contents of the chemical components of the cell membrane varies widely from one type of the membrane to another? **(10 marks)**

(ii) On the basis of the **"Fluid mosaic model"**. Explain the different functions of the plasma membrane. **(05 marks)**

b) Describe how macro-molecules like proteins are transported into the cell. **(05 marks)**

3a) (i)Compare photosynthetic electron transfer reaction with photosynthetic carbon reduction cycle. **(05 marks)**

(ii) How are the **photosynthetic units** adapted to the light stage of photosynthesis? **(05 marks)**

(iii) Hatch-slack pathway is **more expensive** in terms of energy than C3 cycle. Explain why the hatch-slack pathway is still of an **adaptive advantage**? **(03 marks)**

b) How are the distinct layers of the stomach of adaptive significance to digestion of nutrients? **(07 marks)**

4a) Explain how sickle cell shows the following.

(i) **Co-dominance**. **(03 marks)**
(ii) **Incomplete dominance**. **(03 marks)**
(iii) **Pleiotropy**. **(03 marks)**

b) (i)Why are **Pure-lines** at a disadvantage when environmental conditions change? **(03 marks)**

(ii) In Mice, a dominant **allele C** must be present for pigmentation of coat. The kind of pigment depends on the another gene locus, thus **B**, produces black and **homozygous double recessive** produces **brown**. Double recessive for gene**, C,** are **albinos**. A homozygous black female **was test crossed** with albino male. What Phenotypic ratio is expected?

a) Filial Phase one

b) **Filial phase two.** **(08 marks)**

5a) (i)Describe the different **direct effects** of light on the **physiological** activities of plants. **(10 marks)**

(ii) How are **positive interactions** in a community beneficial to the species? **(10 marks)**

6a) (i) Explain why proteins show **a wide** variety? **(07 marks)**

(ii) How would **Overlapping genetic code** be of an advantage in organisms with limited amount of **DNA?** **(03 marks)**

b) Describe the roles of proteins in the following.

(i) **Fluid exchange and blood thickness**. **(05 marks)**

(ii) **Buffering**. **(05 marks)**

HAPPY YULETIDE AND CHRISTMASTIME.

Mugwe martin-2022.