MOCK SET I EXAMINATIONS 2019

UGANDA ADVANCED CERTIFICATE OF EDUCATION

BIOLOGY (THEORY)

P530/2

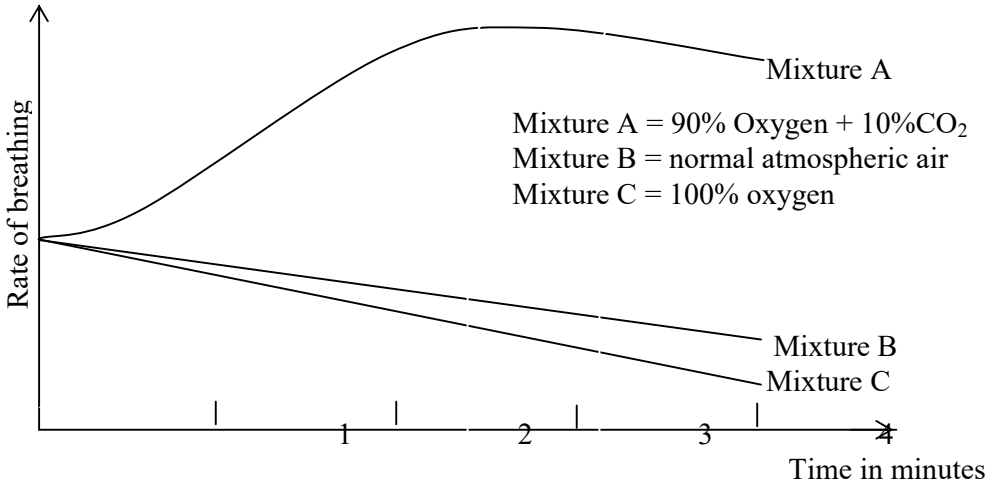
TIME: 2 ¼ HOURS

INSTRUCTIONS TO CANDIDATES.

- Answer question one in section A, plus three others from section B.
- Candidates are advised to read questions carefully, organise their answers and present them precisely and logically, illustrating with well – labelled diagrams wherever necessary

SECTION A (40 MARKS)

1. In an experiment, a subject was given various mixtures to breath and the rate of breathing was measured.
   The results are shown below in graph 1



Graph 1

Five small discs cut from spinach leaves were floated in a small volume of buffered hydrogen carbonate solution in a flask attached to a respirometer. The discs were first exposed to bright light, then to dim light and finally left in the dark. Oxygen release was recorded as positive values and oxygen up take as negative values

The results obtained from the experiment are given below in table 1.

Light intensity	Time interval in minutes	Oxygen uptake or release for each 3 minutes interval (mm^3)
Bright light	0-3 3-6 6-9 9-12	+57 +64 +58 +60
Dim Light	12-15 15-18	+16 +3
Dark	18-21 21-24 24-27 27-30	-16 -12 -15 -14

Use the information to answer the questions that follow.

a)(i) Present the data in table 1 in suitable graphical form (7 marks)
(ii) Calculate the mean rate of oxygen release in bright light (2 marks)
(iii) Explain the significance of the results obtained from this experiment (11 mks)

b) Explain what the data in graph 1 show concerning how the rate of breathing is controlled. (10 marks)

c) In the light of the information provided by graph 1. Show why mouth to mouth resuscitation is a better means of artificial respiration than pressing on the chest wall. (4 marks)

d) Why is it more dangerous to rebreathe expired air if it is passed through soda lime (6 marks)

SECTION B

Attempt 3 questions.

2. What is meant by the following terms?
   a) Ozone 5 marks)
   b) Greenhouse effect (5 marks)
   c) Acid rain (5 marks)
   d) Biomagnification (5 marks)

3. a) Discuss the functional properties of skeletal muscles. (8 marks)
   b) Explain how the balance of the body is achieved (7 marks)
   c) Explain echolocation in bats (5 marks)

4. a) Discuss the various mechanisms of hormonal action (7 marks)
   b) Show the effects of hypo and hyper thyroidism. (6 marks)
   c) Explain how throxine and cortisone are controlled. (7 marks)

5. a)There are three stages in the release of energy from a molecule of glucose; glycolysis, tricarboxylic acid (kreb's) cycle and the electron transfer system.
   What are the essential features of each of these processes? (10 marks)

   b) In what circumstances would you expect anaerobic respiration of glucose to occur in
   i) yeast (2 marks)
   ii) a flowering plant (4 marks)
   iii) a mammal (4 marks)

6. a) Mutations are normally harmful, when in homozygous recessive state and yet they Sometimes do not disappear from the population in a few generations. Why is this so? Illustrate your answer using sickle cell anaemia (5 marks)

   b) What factors are likely to bring about change in frequency of a particular gene in a population (15 marks)

END