

P530/2
Biology Theory
June, 2014
2½ hours

EXTERNAL BIOLOGY EXAMINATION

Uganda Advanced Certificate of Education

Senior Six

Theory P530/2

Time: 2½ hours

Instructions:

- Answer question **one** in Section A plus **Three** others from Section B.
- You are advised to read the questions carefully, organize your answers and present them precisely and logically, illustrating with well labeled diagrams wherever necessary.

SECTION A: (40 Marks)

1. The table below shows the effect of temperature on the rate of photosynthesis in two grasses, **Agropyron** and **Bouteloua**.

Leaf temperature ($^{\circ}\text{C}$)	Rate of photosynthesis in arbitrary units	
	Agropyron	Bouteloua
10	23	10
15	26	15
20	30	19
25	31	24
30	30	30
35	27	35
40	20	39
45	10	38

- a) Plot the data on graph paper (08 marks)
- b) From your graph, determine the rate of photosynthesis at 22°C for each grass. (01 mark)
- c) Account for the variation in the rate of photosynthesis for **Agropyron** between;
- i) $10 - 25^{\circ}\text{C}$ (03 marks)
 - ii) $25 - 45^{\circ}\text{C}$ (06 marks)
- d) Compare the two graphs (06 marks)
- e) i) Describe the photosynthetic mechanism which is likely to occur in the cytoplasm of the mesophyll cells of **Bouteloua** (04 marks)
- ii) Explain the physiological significance of the mechanisms described in (e) (i) above. (04 marks)
- f) Basing on the data provided, outline the physiological and ecological advantages of **Bouteloua** over **Agropyron**. (05 marks)
- g) What is meant by CAM? (03 marks)

SECTION B (60 MARKS)

- 2) Describe the events which occur during a heart beat. (16 marks)
b) Outline the features which ensure efficient flow of blood within the mammalian body (04 marks)
3. a) Describe the P. Mitchell's physiology which occur inside the mitochondria. (14 marks)
b) Without giving the details of electron transport system, explain energy synthesis via the citrate cycle, from ketoglutarate. (06 marks)
- 4a) Describe how a wing generates a lift. (10 marks)
b) Explain the functioning of flight muscles in a housefly. (10 marks)
- 5a) i) What is meant by an organ of Corti? (02 marks)
b) Explain how the lowness and loudness of sound are perceived (18 marks)
- 6) Discuss the effects of light on abundance, distribution and morphology of organisms (20 marks)

END