

P530/2  
BIOLOGY  
(Theory)  
Paper 2  
AUGUST, 2019  
2½ hours



JINJA JOINT EXAMINATIONS BOARD  
*Uganda Advanced Certificate of Education*  
MOCK EXAMINATIONS – AUGUST, 2019

BIOLOGY

(THEORY)

Paper 2

2 hours 30 minutes

**INSTRUCTIONS TO CANDIDATES**

*Answer question ONE in section A plus three others from section B.*

*Candidates are advised to read questions carefully, organize their answers and present them precisely and logically.*

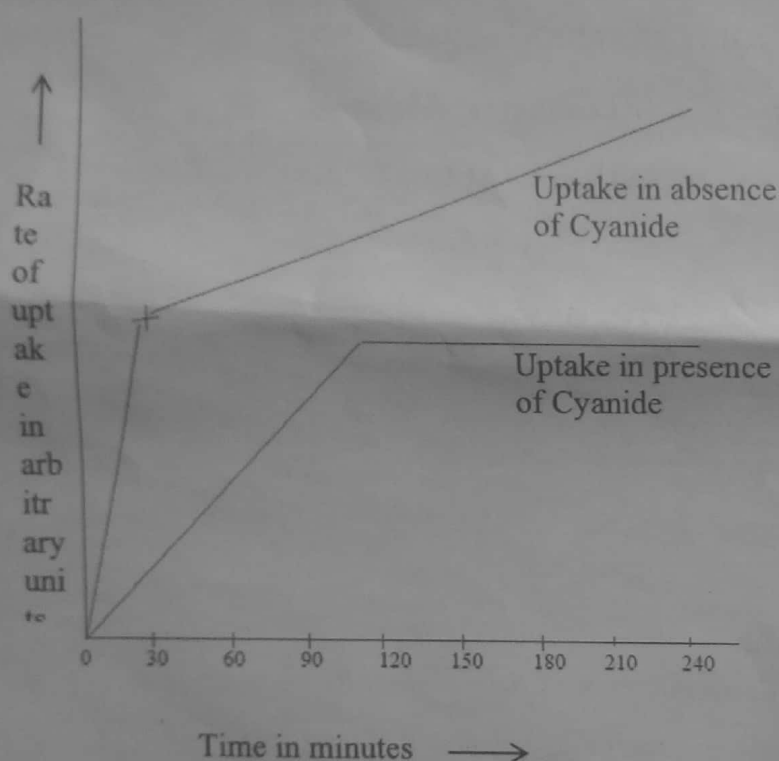
*Illustrate, whenever necessary, with well labelled diagrams.*

### SECTION A (40MARKS)

1. The graph in **Figure 1** shows the result of an experiment on the uptake of minerals by the roots of two crop plants of a species grown in pots, where cyanide was added to the soil for one of the plants.

The table in **Figure 2** shows the results obtained after a period of four weeks in an experiment on the effects of nitrates and phosphates to the growth and development of the same crop plant species in experiment 1.

**Fig.1.**



**Fig.2.**

Nutrients in soil In the pots	Fresh mass (g)	
	Shoot system	Root system
Soil containing all minerals	2.84	0.61
Soil lacking nitrates	2.01	0.31

Soil lacking phosphate	1.80	0.06
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- (a). (i). Suggest the explanation for the differences in the rates of uptake which occurred in the two plants. (12marks)
- (ii). Give **two** other factors that may have similar effect to the uptake of minerals by plants as Cyanide. (02marks)
- (b). (i). State **four** conclusions which can be drawn from the result indicated in figure 2. (04marks)
- (ii). Explain why lack of each of the minerals indicated in the table above produce the above results. (06marks)
- (c). (i). Outline the factors that contribute to mineral salt deficiency in soil for agriculture. (04marks)
- (ii). Explain how some crop plants are able to obtain nitrogen in nitrate deficient soils. (6marks)
- (d). Describe how the nitrates taken up by the crop plants above is made available to the cells in the human body. (05marks)

### SECTION B (60MARKS)

2. (a). Distinguish between natural selection and artificial selection (04marks)
- (b). Explain how man has used the knowledge of selection to his benefits in agriculture. (08marks)
- (c). Discuss in evolutionary terms, the long term effects of excessive use of antibiotics and pesticides. (08marks)
3. (a). Explain each of the following;
- (i). Absence of a specialised system for transport of materials in unicellular eukaryotes. (03marks)
- (ii). Lack of specialised system for transport of gases in flowering plants. (04marks)

- (iii). Restricting haemoglobin to red blood cells in the mammalian blood. (04marks)
- (b). Describe how the structure of mammalian heart caters for the transport needs of mammals. (09marks)
4. (a). Compare the fixation of carbondioxide in C3 and C4 plants. (08marks)
- (b).(i). How does the principle of limiting factors indicate that photosynthesis is a multi-stage process? (02marks)
- (ii). Explain how man has used the knowledge of limiting factors to increase crop productivity. (10marks)
5. (a). Describe how substances used to eliminate organisms in the environment Considered to be harmful to humans may affect other non- targeted individuals including the carnivorous birds. (08marks)
- (b). Explain the advantages which omnivorous mammals have when they feed on food material obtained from animal bodies over feeding on plant materials. (08marks)
- (c). How does the difference in the diets of herbivorous and carnivorous mammals related to the structure of their guts? (04marks)
6. (a). Explain the significance of feedback inhibition in the following.
- (i). Maintaining suitable internal environment of human body. (06marks)
- (ii). Regulation of the population size of animals. (05marks)
- (b). Explain why the negative feedback mechanisms do not necessarily apply to human populations. (09marks)