Name's of student.....
School Name.....

BIOLOGY
PAPER II
P530/2
SENIOR FIVE
NOV-DEC

COMPREHENSIVE BIOLOGY TRANSFORMATION INITIATIVE.
UACE
END OF TERM III EXAMINATION

S.5 SEMI- CANDIDATES

PAPER 2

2 HOURS AND 30 MINUTES

INSTRUCTIONS TO THE CANDIDATES:

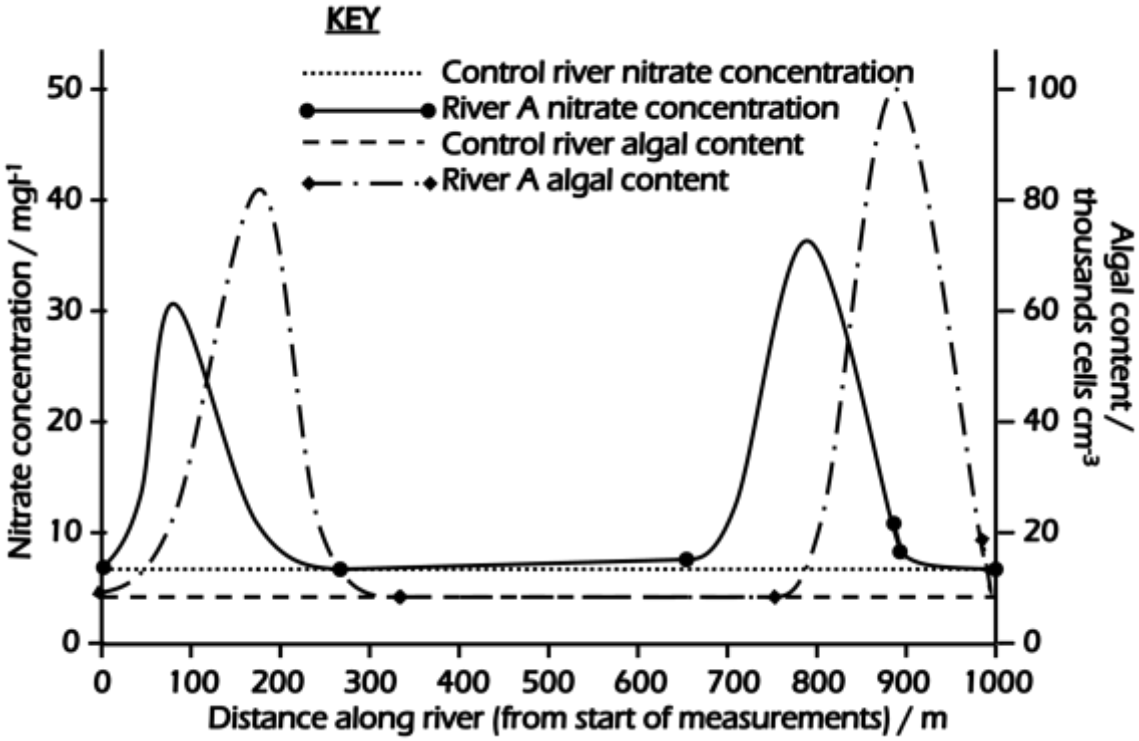
This paper consists of section A and B.

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 diagram wherever necessary.

N.B QUESTION ONE IS COMPULSORY

1. An investigation done by National Environmental Management Authority (NEMA) in River Rwizi (River A) in the western part of Uganda, Mbarara district. The investigation was done at two different points along the stretch of the river to find out the concentration of nitrates and algal content. The first phase of investigation was done at points with no raw sewage discharged (Control) and the second phase was conducted at points with raw sewage discharged. The results are shown in the graph below. Study it carefully and answer questions



a) Compare the Algal content with Nitrate concentration at the polluted areas of river Rwizi. (05 marks)

b) Describe the relationship between Algal content and Nitrate concentrations with increasing distance along the stretch of the river during the second investigation. (07 marks)

c) Explain the relationship described above in (b). (12 marks)

d) Suggest explanations for the following observations.
(i) Zooplanktons peak in their life cycles. Suggest the distance(s) along the stretch of the river you expect them to peak.
(02 marks)
(ii) Distances at which the raw sewerage was discharged.
(02 marks)
(iii) What do the results of the control show?
(02 marks)
e) River Rwizi is a slow flowing river. Suggest how this affects the BOD of the river. (10 marks)

SECTION B (60 MARKS)

CHOOSE THREE QUESTIONS FROM THIS SPREAD

2 a) Describe the relationship between fatty acid composition of the lipid bilayer and fluidity. (05 marks)
b)(i) Describe the functioning of the Metabolic Biological pumps in the transport of glucose molecules across the cell membrane.
(05 marks)
(ii) Describe the differences between integral and peripheral proteins in the cell membrane. (10 marks)
3a) Describe the mechanisms by which the thylakoid membranes convert sunlight energy into ATP and Reduced NADP.
(10 marks)
b) Explain the significances of the following metabolic pathways.
(i) CAM. (05 marks)

(ii) Hatch-Slack. (05 marks)
4a) Explain the significances of the physical properties of water.
(10 marks)

b) Explain the following observations.

(i) Amylose is more difficult to digest than amylopectin. **(05 marks)**

(ii) Variety of proteins exists. **(05 marks)**

5a)(i) Describe the structure of the haemoglobin molecule. **(05 marks)**

(ii) How does the behaviour of haemoglobin change in the different regions of the body? **(05 marks)**

b) Describe the role of the following cells in immunity.

(i) T-cells and Macrophages. **(05 marks)**

(ii) B-cells. **(05 marks)**

6a) Describe how DNA forms an exact copy of itself. **(10 marks)**

b(i) Describe the different forms of chromosomal mutations. **(10 marks)**

END

CC-comprehensive Biology Transformation initiative.

Transforming Biology Pedagogy.

Contributions made by MUGWE MARTIN.