JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY

SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOLOGICAL SCIENCES

4th YEAR FIRST SEMESTER 2016/2017 ACADEMIC YEAR

MAIN CAMPUS - REGULAR

COURSE CODE: SBI 3438

COURSE TITLE: AQUATIC ECOLOGY

EXAM VENUE: **STREAM: (BSC BIO)**

DATE:14/12/16 **EXAM SESSION: 2.00 – 4.00PM**

TIME: 2 HOURS

Instructions:

1. **Answer ALL questions in Section A and Any <u>TWO</u> questions in Section B**
2. **Candidates are advised not to write on question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)

1. Distinguish between the following; (3 marks)
   i. Epiphytic and Epilithic algae
   ii. Point and non point pollution
   iii. Eutrophic and Oligotrophic lakes
2. State three biotic and three abiotic factors that influence phytoplankton populations in freshwater. (3 marks)
3. State any three ecosystem services mangroves along the East African coast provide. (3 marks)
4. Mangroves occupy highly changing physical environments. Explain three adaptations mangroves have evolved to cope in such environments. (3 marks)
5. Explain why over fertilization of fish ponds should be avoided. (3 marks)
6. State 3 main adaptations of phytoplankton against sinking. (3 marks)
7. State 3 major photosynthetic pigments in algae. (3 marks)
8. Explain why phosphorus is often the limiting nutrient in freshwater. (3 marks)
9. Explain the differences between: (3 marks)
   i. Mazimum depth (Z_m) and Mean depth (Z)
   ii. Shore Line (L) and shoreline development (D_L)
   iii. Allochthonous and Autochthonous sources of nutrients
10. Name the three species in which $C0_2$ can exist in water. (3 marks)

SECTION B: ESSAY QUESTIONS (40 MARKS)

11. Discuss the main factors influencing abundance and distribution of benthic macroinvertebrates in streams and rivers and the adaptations of invertebrates to fast flowing waters (20 marks)

12. Compare and contrast life history of the cladocera and the copepoda (20 marks)

13. Lake George in Uganda has a mean depth of about 5M while Lake Windermere in UK has a mean depth of about 8M. Discuss why gross annual primary productivity is higher in Lake George than in Lake Windemere. (20 marks)

14. Coral reefs have been described as marine 'tropical rainforests' in comparison to the forest's high species diversity.

i. Discuss the reasons for the high species diversity in the coral reef ecosystem.(12 marks)

ii. Identify the major threats to coral reefs along the East African coast (8 marks)