JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE & TECHNOLOGY

SCHOOL OF BIOLOGICAL AND PHYSICAL SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

4th YEAR SECOND SEMESTER 2016/2017 ACADEMIC YEAR UNIVERSITY EXAMINATION FOR THE DEGREE BACHELOR OF SCIENCE IN BIOLOGICAL SCIENCES

REGULAR

COURSE CODE:	**SBI 3421**
COURSE TITLE:	**ENVIRONMENTAL PHYSIOLOGY**
EXAM VENUE:	**STREAM: (BSC. BIO)**
DATE:	**EXAM SESSION:**

TIME: 2 HOURS

Instructions:

1. **Answer ALL questions in Section A and Any two 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. Differentiate between:
   a) Conformity and regulation (1.5 marks)
   b) Phenotypic Plasticity and Phenotypic Flexibility (1.5 marks)
2. Explain two reasons to justify the buffallos at Lake Nakuru wallowing in the mud. (3 marks)
3. Citing one example, differentiate between aestivation and hibernation. (3 marks)
4. Explain how osmoregulation is achieved by fish in fresh and saline water. (3 marks).
5. List four differences between Aestivation and Hibernation (2 marks)
6. State three steps involved in homeostasis (3 marks)
7. List three adaptations that some fauna have to survive in desert environments and describe how they are beneficial. (3 marks)
8. Explain how do organisms improve negative feedback and what happens when they are not able to achieve homeostasis. (4 marks)
9. Explain how ectotherms control their body temperature. (3 marks)
10. List three important measurements associated with negative homeostatic feedback. (3 marks)

SECTION B: ESSAY QUESTIONS (40 MARKS)

11. A) Physiological investigations range from examining the molecular basis of life to understanding the integrative functions of biological systems. Discuss. (10 marks)
    B) Discuss osmoregulation in a named vertebrates found in Saline aquatic ecosystem (10 marks)
12. Biological rhythms allows an organism to harmonize successfully with its environment. Discuss. (20 marks)
13. Discuss the protective measures required to keep endotherm cells alive during periods of hibernation. (20 marks)
14. A) Discuss five types of adaptations exhibited by animals. (10 marks)
    B) Choose one of Earth's four interacting spheres (atmosphere, biosphere, hydrosphere, lithosphere) and discuss its hypothesized origin, how it has been altered by human activities, and how these alterations have affected its interaction with the other spheres, creating environmental challenges for humans. (10 marks)