

ZOO 403E  
ENVIRONMENTAL PHYSIOLOGY



**ALUPE UNIVERSITY**  
COLLEGE

*...Bastion of Knowledge...*

P. O.Box 845-50400 Busia(K)  
[principal@auc.ac.ke](mailto:principal@auc.ac.ke)  
Tel: +254 741 217 185  
+254 736 044 469  
off Busia-Malaba road

OFFICE OF THE DEPUTY PRINCIPAL  
ACADEMICS, STUDENT AFFAIRS AND RESEARCH

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## UNIVERSITY EXAMINATIONS

### 20201/2022 ACADEMIC YEAR

FOURTH YEAR FIRST SEMESTER MAIN EXAMINATION

## FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

**COURSE CODE: ZOO 403E**

**COURSE TITLE: ENVIRONMENTAL PHYSIOLOGY**

**DATE: 25<sup>TH</sup> JANUARY 2022**

**TIME: 2.00PM-5.00 PM**

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### INSTRUCTIONS TO CANDIDATES

- SEE INSIDE

**THIS PAPER CONSISTS OF 3 PRINTED PAGES**

**PLEASE TURN OVER**

ZOO 403E  
ENVIRONMENTAL PHYSIOLOGY

REGULAR – MAIN EXAM

ZOO 403E: ENVIRONMENTAL PHYSIOLOGY

STREAM: BED (SCIENCE)

DURATION: 3 Hours

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INSTRUCTIONS TO CANDIDATES

- i. Answer **ALL** questions from section A and any **FOUR** from section B.
- ii. Diagrams should be used whenever they serve to illustrate the answer.
- iii. Do not write on the question paper.

SECTION A (30 MARKS)

**Question One**

- a) Define homeostasis. (2 Marks)
- b) Explain the danger of high temperature in organisms. (2 Marks)
- c) Illustrate the three components of homeostatic control. (6 Marks)
- d) Describe glomerular filtration in kidneys. (5 Marks)

**Question Two**

- a) Describe the gross structure of the kidney and the detailed structure of the nephron with its associated blood vessels as seen in photomicrographs and electron micrographs. (10 Marks)
- b) Define homeotherms and cite one example. (2 Marks)
- c) Illustrate counter-current heat exchange in organisms. (3 Marks)

SECTION B (40 MARKS)

**Question Three**

- a) Give an account for the higher energy requirements in smaller organisms compared to larger ones. (2 Marks)
- b) Describe torpor, hibernation and estivation and show their significance in animals. (8 Marks)

**Question Four**

- a) What are hormones? (2 Marks)
- b) Complete the table below for the various hormones involved in

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osmoregulation.

(8 Marks)

Hormone	Where produced	Function
Epinephrine and Norepinephrine	Adrenal medulla	
	Kidney nephrons	Increases blood pressure by acting on angiotensinogen
Angiotensin		
Aldosterone	Adrenal cortex	
	Hypothalamus (stored in the posterior pituitary)	
Atrial natriuretic peptide		Decreases blood pressure by acting as a vasodilator and increasing glomerular filtration rate; decreases sodium reabsorption in kidneys

**Question Five**

a) What is pH? (2 Marks)

b) Discuss how homeosis ensures the acid-base balance in the body

is correct. (8 Marks)

**Question Six**

a) What is the role of sweat in thermoregulation? (2 Marks)

b) Discuss the mechanism of thermoregulation in animals. (8 Marks)

**Question Seven**

a) Define urea cycle. (2 Marks)

a) Describe the significance of respiration in animals. (8 Marks)

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