



TECHNICAL UNIVERSITY OF MOMBASA

School of Applied and Health Sciences
DEPARTMENT OF ENVIRONMENT AND HEALTH SCIENCES
UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN FISHERIES AND OCEANOGRAPHY (BSFO 2023S)
AFO 4207: AQUATIC VERTEBRATE ZOOLOGY
END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2024 SERIES
TIME: 2 HOURS
DATE: DECEMBER 2024

Instructions to Candidates

You should have the following for this examination

Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt **question ONE (Compulsory) and any other TWO questions.**

Do not write on the question paper.

Question One (25 Marks)

- a) Using examples of aquatic vertebrates, define the following terms;
- i) Adaptive radiation (2 marks)
 - ii) Poikilothermy (2 marks)
 - iii) Viviparity (2 marks)
- b) The subphylum Cephalochordata are close relatives of vertebrates. Outline TWO general characters of this group (2 marks)
- c) i) Using examples name the sub-classes under the class chondrichthyes (3 marks)
ii) Describe briefly the various types of scales in bony fishes (4 marks)
- d) Explain the role of the following structures to the aquatic animals that possess them
- i) Pelvic fins (2 marks)
 - ii) Cleidoic eggs (2 marks)
- e) Explain the utility of the lymphatic system in vertebrates (3 marks)
- f) The evolution of aves required adaptive radiation for arboreal life. Outline three (3) major features that were acquired by aquatic birds for this kind of life (3 marks)
- g) Outline three (3) outstanding features of aquatic mammals (3 marks)

h) Explain the importance of the Swim bladder in fishes (2 marks)

Question Two (25 Marks)

a) With appropriate examples, outline major features of the subclasses of Osteichthyes (8 marks)

b) Explain three (3) adaptation of amphibians to terrestrial life (6 marks)

c) Describe three ways in which reptiles employ to obtain food (6 marks)

Question Three (25 Marks)

a) Outline the major groups of mammals based on their reproductive biology (6 marks)

b) Using examples, explain the features of animals in the Order Sirenia (10 marks)

c) Using examples describe the features of aquatic ungulates (3 marks)

Question Four (25 Marks)

a) Discuss the mode of Excretion in Marine Fishes (8 marks)

b) Compare the mechanism of osmoregulation in Fresh water Fishes and Marine fishes (12 marks)

Question Five (25 Marks)

a) Outline the three main patterns of sexual reproduction demonstrated in vertebrates (6 marks)

b) Outline the factors determining the clutch size in aquatic birds (7 marks)

c) Discuss egg laying and nesting in aquatic birds (7 marks)