INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF BUSINESS MANAGEMENT

END OF SEMESTER EXAMINATIONS - DECEMBER 2025

PROGRAMME: BTHM
YEAR/SEM: YEAR 1/SEMESTER 2
COURSE CODE: BTHM 1203
NAME: ANIMAL ECOLOGY

DATE:
TIME:

INSTRUCTIONS TO CANDIDATES:

SECTION A

Section A is a case study and it is Compulsory (40 marks)

Question 1:

Case Study: Adaptations of Emperor Penguins (Aptenodytes forsteri) in Antarctica

In the harsh Antarctic environment, Penguins (Aptenodytes forester have evolved remarkable adaptations to survive and thrive. These penguins breed in the winter, with males incubating eggs on their feet for up to 2 months while females forage for food in the surrounding waters. To conserve energy, Penguin huddle together in large colonies, reducing their metabolic rate and conserving heat. Their feathers provide excellent insulation, with a layer of air trapped next to their skin to prevent heat loss. In addition, Penguins have a unique adaptation called "torpor," where their metabolic rate slows down to conserve energy during periods of food scarcity.

Required

(a) Examine the unique adaptation that Emperor Penguins use to conserve energy during periods of food scarcity (10 marks)

(b). Explain how Penguin conserve heat in their Antarctic breeding colonies (5 marks)

(c) Examine the main food source for Penguins in Antarctic waters (2 marks)

(d) Explain how Penguins adapt to the harsh Antarctic environment during breeding season (10 marks)

(e.) The Penguins are vulnerable to climate change, overfishing, and habitat degradation. Explain the conservation strategies required to protect Penguin and their habitats, taking into account the impacts of human activities. (13 marks)

Question 2:

Case study: Foraging Behavior of the African Elephant (Loxodonta africana)

African elephants (Loxodonta africana) are large herbivores that inhabit savannas and grasslands, where they forage on a wide variety of plants. They use their trunks to pluck fruits, leaves, and branches, and their tusks to dig up roots and tubers. Elephants are selective feeders, choosing plants with high nutritional value, such as those with high protein and low fiber content. They also use their keen sense of smell to detect ripe fruits and their excellent memory to recall the location of water sources and food-rich areas. During the dry season, elephants migrate to areas with more abundant food, often traveling long distances to reach nutrient-rich habitats.

(a) Explain the main food sources for African elephants in their savanna habitats (5 marks)

(b) Explain how elephants use their trunks and tusks in foraging (5 marks)

(c). Examine the factors which influence food selection of African elephants. (10 marks)

(d) Explain how elephants adapt their foraging behavior during the dry season (5 marks)

(e) Explain the role memory play in elephant foraging behavior (5 marks)

(f) Describe the conservation strategies which should be implemented to protect elephant food sources and habitats (10 marks)

SECTION B

Answer any Three Question

Question 1:

1. Discuss the physiological and behavioral adaptations of animals that enable them to survive in arid desert environments. Use examples from the Sahara Desert. (20 marks)

Question 2:

Examine the adaptations of animals that live in polar regions, such as the Arctic and Antarctic. Discuss how these animals cope with extreme cold, limited food availability, and harsh weather conditions. (20 marks)

Question 3:

Describe the scientific classification of the African Elephant (Loxodonta Africana), including its kingdom, phylum, class, order, family, genus, and species. Discuss the unique characteristics that distinguish it from other elephant species. (20 marks)

Question 4:

. (a) Explain the key factors that influence the evolution of animals (8 marks)

(b) Discuss the role of aggression in establishing and maintaining dominance hierarchies in animal societies, using examples from species like wolves, chimpanzees, or hyenas. (12 marks)

Question 5:

5. (a)Discuss the benefits and costs of group living in animals, using examples from Uganda's wildlife, such as lions, chimpanzees, or elephants. (10 marks)

(b) Examine the role of communication in animal groups, including vocalizations, body language, and chemical signals. (10 marks)

Question 6:

Examine the key characteristics of birds and explain how these adaptations enable birds to occupy a wide range of ecological niches, from forests to grasslands. (20 marks)

Question 7:

Discuss the characteristics of carnivorous mammals, focusing on their dental and skeletal adaptations, digestive systems, and hunting strategies. Use examples from Uganda's carnivorous fauna, such as lions, leopards, or hyenas. (20 marks)

Question 8:

(a) Discuss the key differences between vertebrates and invertebrates using examples from Uganda's fauna to illustrate these differences. (10 marks)

(b) Discuss the conservation strategies used to protect and restore habitats in your country (10 (marks)

Question 9:

. a) Discuss the impact of human activities on animal habitats (10 marks)

(b) Examine the conservation efforts which can be employed to mitigate these impacts (10 marks)

Question 10:

(a). Discuss the factors that influence habitat selection in animals. (10 marks)

(b) Examine the consequences of habitat selection (10 marks)

Question 11:

Discuss the human-wildlife conflict in Murchison Falls National Park, highlighting the conservation implications and proposing strategies for mitigating these conflicts and protecting the park's biodiversity. (20 marks)

Question 12:

Discuss the human-wildlife conflict in Murchison Falls National Park, highlighting the conservation implications and proposing strategies for

mitigating these conflicts and protecting the park's biodiversity. (20 marks)