



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024**

- COURSE NAME : TERRESTRIAL ECOSYSTEM
MANAGEMENT
- COURSE CODE : BWJ 31103
- PROGRAMME CODE : BWW
- EXAMINATION DATE : JULY 2024
- DURATION : 3 HOURS
- INSTRUCTIONS :
1. ANSWER ALL QUESTIONS
 2. THIS FINAL EXAMINATION IS CONDUCTED VIA
 Open book
 Closed book
 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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Q1 The classification of ecosystem services serves as a cornerstone in the quest for effective and holistic terrestrial ecosystem management, ensuring the preservation of biodiversity, ecosystem resilience, and the provision of essential goods and services for both current and future generations.

- (a) Name the individual who introduced the concept of the 'ecosystem' as a fundamental unit of ecological study. (1 mark)
- (b) Identify who perceives ecosystem services in a more anthropocentric manner, emphasizing direct benefits enjoyed by humanity. (1 mark)
- (c) List **TWO (2)** primary direct causes of biodiversity loss that contribute to a global decline of over 20% in biodiversity. (2 marks)
- (d) Describe in brief **THREE (3)** classifications of ecosystem services according to Common International Classification of Ecosystem Services (CICES). (6 marks)
- (e) Demonstrate **THREE (3)** key impacts on global conservation efforts resulting from The Millennium Ecosystem Assessment (MEA) ecosystem service classification, which was the first to categorize ecosystem services for better understanding. (6 marks)
- (f) Determine **ONE (1)** example of supporting services according to the MEA supporting services classification. (1 mark)
- (g) Compare **ONE (1)** characteristic of provisioning, regulating, cultural, and supporting services according to the MEA framework. (8 marks)

Q2 The dynamics of ecosystem structure refer to the ever-changing composition, organization, and interrelationships within terrestrial ecosystems. Understanding these dynamics is essential for effective terrestrial ecosystem management.

- (a) List **TWO (2)** components of ecosystem. (2 marks)
- (b) Define functional group in ecology. (2 marks)

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- (c) Explain **THREE (3)** impacts of an imbalance in ecosystem components.
(6 marks)
- (d) Interspecies interactions have a profound impact on terrestrial ecosystem management because they directly influence species populations, community dynamics, and ecosystem functions. Identify the specific interspecies interaction described below.
- (i) Different bird species may compete for the same nesting sites in a tree — the limited availability of good nesting spots means not all individuals will be able to reproduce, impacting their populations.
(1 mark)
- (ii) A large tree shading the ground below it can prevent the growth of smaller plants that need full sunlight — the tree is unaffected, but the smaller plants may die or not grow due to lack of light.
(1 mark)
- (iii) Lions hunting zebras — the lions benefit by getting a meal, while the zebras are killed in the process.
(1 mark)
- (iv) Ticks on a dog — ticks feed on the dog's blood, which can weaken the dog and sometimes transmit diseases.
(1 mark)
- (v) A non-native plant species that spreads in a new area without affecting or being affected by the local species — this is a rare type of interaction because most species impact others in some way, either directly or indirectly.
(1 mark)
- (vi) Barnacles on a whale — barnacles attach themselves to the whale's skin, gaining mobility and access to more food currents, while the whale neither benefits nor suffers significantly from their presence.
(1 mark)
- (vii) Bees and flowers — bees get nectar from the flowers as a food source, while the flowers benefit from the bees' pollination services as the bees move from flower to flower.
(1 mark)
- (e) Differentiate between the functions of shredders, collectors, scrapers and macrophytes piercer in the ecosystem.
(8 marks)

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- Q3** Ecosystem processes are intimately linked to terrestrial ecosystem management, guiding the design and implementation of strategies to sustainably steward terrestrial ecosystems for societal and ecological well-being.
- (a) Define energy flow in ecosystem process.
(2 marks)
 - (b) Discuss **THREE (3)** reasons why terrestrial management for conservation primarily focuses on the ecosystem level.
(6 marks)
 - (c) Define protected areas according to The International Union for Conservation of Nature (IUCN).
(2 marks)
 - (d) Compare nutrient transfer and energy transfer based on their nature, sources, transfer mechanisms, and conservation.
(8 marks)
 - (e) Determine **FOUR (4)** indicators that can be used to assess ecosystem stability.
(4 marks)
 - (f) Choose **THREE (3)** methods that can be used for the assessment of biodiversity as indicators for ecosystem stability.
(3 marks)

Q4 An ecosystem is the living organisms, their environment, and their interrelations with their environment's non-living components. Understanding our ecosystem and those of the world helps us understand the earth better.

- (a) Define ecosystem-based management (EBM).
(2 marks)
- (b) Identify **THREE (3)** fundamental concepts of ecosystem-based management (EBM).
(6 marks)
- (c) Define priority species.
(2 marks)
- (d) Research and management experience from around the world have demonstrated the importance of EBM and have informed the development of core EBM principles. Demonstrate **SEVEN (7)** ways in which EBM principles are being applied in Western countries.
(7 marks)

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- (e) Distinguish between the stated species classifications of Priority Species, Keystone Species, Indicator Species, and Flagship Species.

(8 marks)

- END OF QUESTIONS -

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