



**UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA**  
**FIRST SEMESTER EXAMINATIONS, MAY 2018**

**COURSE NO:** ES 172

**COURSE NAME:** INTRODUCTION TO ECOLOGY AND BIODIVERSITY

**CLASS:** ES 1

**TIME: 3 HRS**

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Name: \_\_\_\_\_ Index Number: \_\_\_\_\_

**Section A (40 marks)**

**Answer All Questions** (Select the best option)

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1. Major difference between standing and flowing water ecosystem are the following
  - a. Current and movement of water
  - b. The close association with surrounding land areas
  - c. The constant high oxygen content
  - d. Small thermal and chemical stratification
2. The study of the ecosystem seeks to explain
  - a. Life processes, interactions and adaptations
  - b. The movement of material and energy through living communities
  - c. To provide solely for human development and needs
  - d. Abundance and distribution of organisms
  - e. Biodiversity in the context of the environment
3. The following are all importance of biodiversity except.
  - a. It maintains balance of the ecosystem
  - b. It provides biological resources
  - c. It increases population
  - d. It provides social benefits
4. Earthworms and bacteria are called \_\_\_\_\_.
  - a. Producers
  - b. Decomposers

- c. Consumers
  - d. None of the above
5. When we cut down trees, the amount of oxygen in the atmosphere \_\_\_\_\_.
- a. Increases
  - b. Decreases
  - c. Remains the same
  - d. Both (a) and (b)
6. In the food chain:  
Acorns ---> squirrels ---> fox ----> bacteria, the squirrel is a\_\_\_\_\_.
- a. Producer
  - b. Primary consumer
  - c. Secondary consumer
  - d. Detritivore
7. Trophic levels in an ecosystem is formed by .....
- (a) Only herbivores      (b) Only plants    **(c) Organisms linked in a food chain**    (d) Only bacteria
8. The process of converting nitrate to nitrogen gas and nitrous oxide is called...
- (a) Ammonification    (b) Nitrogen fixation    (c) Eutrophication
- (d) Denitrification
9. . Which of the following contains a lot of carbon?
- (a) Fossil fuel    (b) Ocean    (c) All of the above    (d) None of the above
10. What type of organism carries out nitrogen fixation?
- (a) Bacteria    (b) Fungi    (c) Protozoa      (d) All of the above
11. The exchange pool in the carbon cycle is .....
- (a) fossil fuels    (b) sedimentary rock    (c) the atmosphere    (d) the oceans
12. The cycling of water through the hydrological cycle depends on ...
- (a) transpiration from plants      (b) precipitation to the ocean      (c) evaporation from the soil      (d) all of the above

13. Bacteria and fungi decompose organic material making food available for other detritivores in a....
- (a) Grazing food chain
  - (b) Detritus food chain
14. A grazing food chain might begin with ...
- (a) earthworms
  - (b) sugar maples
  - (c) mushrooms
  - (d) All of the above
15. Upper part of the sea/aquatic ecosystem contains .....
- (a) Plankton
  - (b) Nekton
  - (c) Benthos
  - (d) Plankton and nekton
16. Which of the following is not an indirect value of biodiversity?
- (a) Runoff from natural ecosystems pollutes sources of fresh water
  - (b) Regulation of climate
  - (c) Prevention of soil erosion
  - (d) Participation in biogeochemical cycles
17. Water is a resource that is .....
- (a) Non-degradable and non-maintainable
  - (b) Degradable and maintainable
  - (c) Renewable
  - (d) Non-renewable
18. Which activity does not constitute habitat loss?
- (a) Highway construction
  - (b) Forest fragmentation as new houses are built

- (c) Converting wetland to housing areas
- (d) None of the above
- (e) Both a and b

19. Benthic animals .....

- (a) Are submerged in an area
- (b) Are deep dwellers in the sea
- (c) Are floating organisms
- (d) Float on the sea surface

20. When huge amounts of sewage is dumped into a river, its dissolved oxygen level will .....

- (a) Increase slightly
- (b) Remain unchanged
- (c) Increase significantly
- (d) Decrease

21. The following are all stresses on aquatic ecosystems except .....

- (a) Light availability
- (b) Native species
- (c) Temperature change
- (d) Overharvesting

21. High oxygen demand in an aquatic ecosystem indicates .....

- (a) Less polluted water
- (b) Less number of organisms
- (c) More polluted water

(d) None of the above

22. What factors reduces the amount of dissolved oxygen in freshwater ecosystem....., ..... and .....

23. Why would a fish resort to air gulping in an aquatic ecosystem .....

24. 3 examples of marine ecosystem ....., ..... And .....

25. Species described as playing a critical role in maintaining the structure of an ecological connectivity, affecting many other organisms in an ecosystem and helping to determine the types and numbers of various other species in the community is called .....

26. What is another name for a desert? The biotic characteristics of an aquatic ecosystem are mainly determined by the organisms that occur in the ecosystem. Explain with examples

27. Pelagic is opposite of the ..... Zone.

The health of an aquatic ecosystem is degraded when the ecosystem's ability to absorb a stress has been exceeded. A stress on an aquatic ecosystem can be a result of ....., ..... or ..... alterations of the environment.

28. Ecosystems are self-contained and nutrients only cycle within a particular ecosystem.

- a. True
- b. False

29. The transfer rate of carbon due to photosynthesis, cellular respiration and decay are just about even.

- a. True
- b. False

30. Ecosystems are made up of organisms and resource

- a. True
- b. False

31. Some of the plankton are able to move up into the limnetic zone at day and down to the bottom during the night

- a. True
- b. False

32. Nutrients can flow between terrestrial and aquatic ecosystems.

- (a) True
- (b) False

33. The detrital and grazing food chains are interconnected by detritivores like earthworms and salamanders which become food for above-ground consumers.

- (a) True                      (b) False

34. An infinite number of carnivores can be supported in a food web?

- (a) True                      (b) False

**Section B (60 marks)**

**ANSWER QUESTION ONE (1) AS A COMPULSORY QUESTION AND ANYOTHER TWO (2)**

**Question One [Total of 20 Marks]**

a. An area has been earmarked for protection because it has been declared a key biodiversity hotspot. However, the local communities are directly dependent on the area's wild natural resources for their livelihoods. As conservation manager, discuss the natural resource management approach you would recommend to balance ecological integrity and local livelihood needs highlighting the key biophysical, social and economic aspects that inform your approach? **[11 marks]**

b. Study the food web in Fig. 1 below and use it to answer the following questions. What happens to the food web if; **[10 Marks]**

- i. The population of grass dies
- ii. The population of slug decreases
- iii. The population of insect decreases

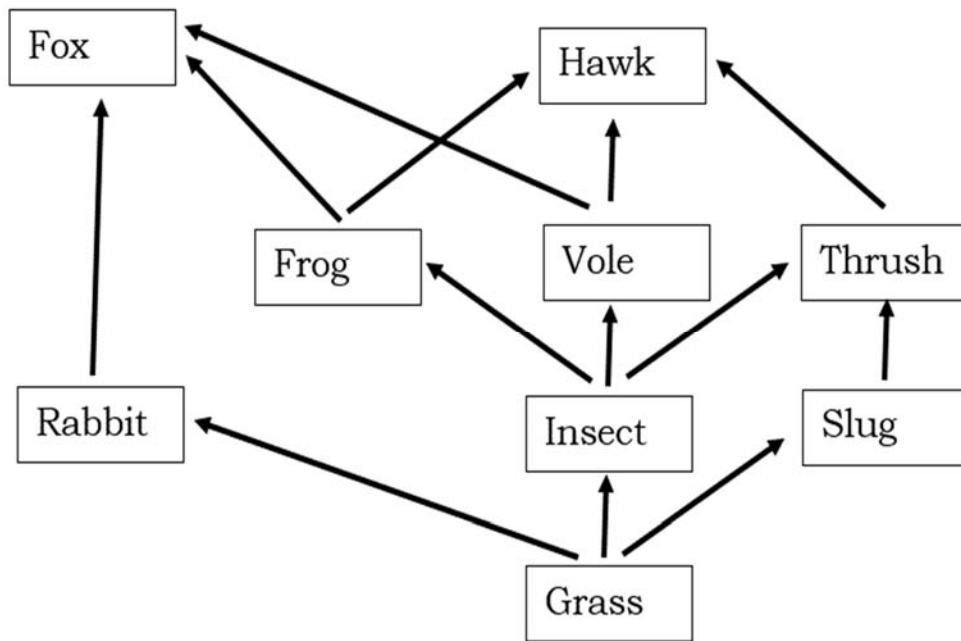
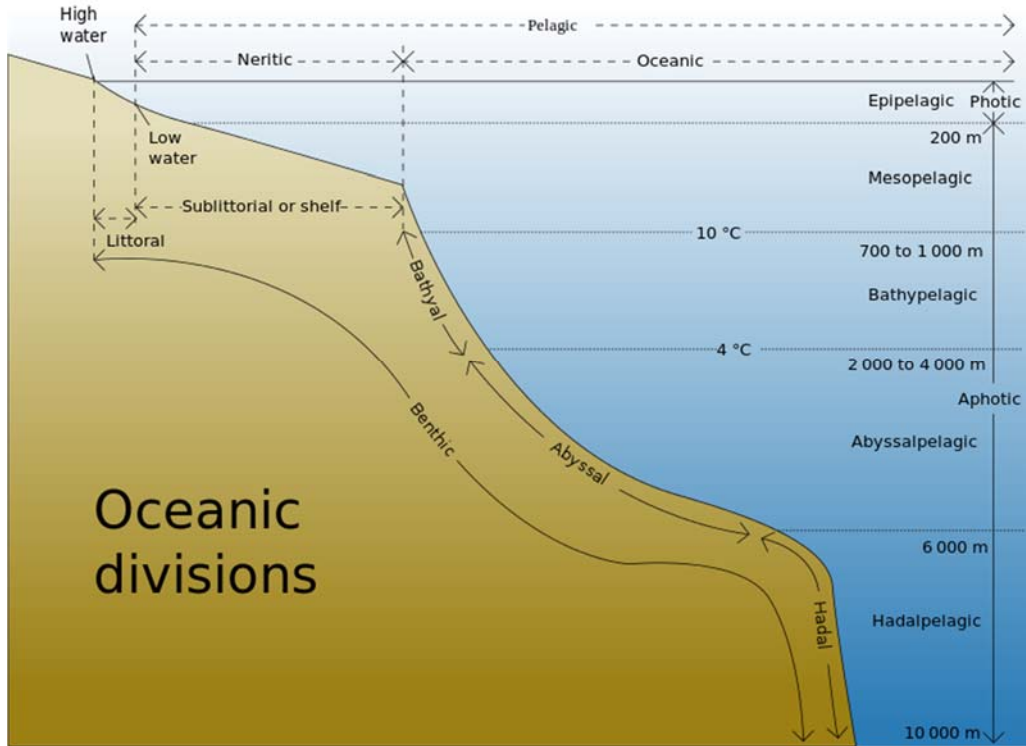


Fig. 1: Food web

Question Two [Total of 20 Marks]

- a. Marine ecosystems can be divided into many zones depending upon water depth and shoreline features. With the help of the diagram below, describe the major depth and divisions in the marine ecosystem. **(14 marks)**



- b. What are the characteristics of upland and lowland rivers? (3 marks)
- c. Explain the importance of information and knowledge of biodiversity for environmental management. (3 marks).

### Question Three [Total of 20 Marks]

- a. Outline any four practical differences between people who are primarily concerned with conservation and those concerned with economic development. [8Marks]
- b. Although algae is an important source of food for aquatic life, excessive growth known as algal bloom which is as a result of eutrophication leads to problems for the aquatic ecosystem. Describe in details the effects of algal bloom on species (fishes) in the aquatic ecosystem. [8 Marks]
- c. What are the 4 aims of the IUCN Red list categories and criteria? [4Marks]

#### Question Four [Total of 20 Marks]

- a. list the names of the mass extinctions that has occurred and give 2 possible causes.  
[7Marks]
- b. There is a sixth mass extinction that has begun, state clearly why it is different from the previous ones and explain the 5 major actives that has contributed to the decline of biodiversity under the sixth mass extinction. [7 Marks]
- c. How does ecotourism differ from conventional tourism and how does ecotourism conserve biodiversity? [6 marks]

#### Question Five [Total of 20 Marks]

- a. List all the categories and the criteria in the IUCN Red list of categories and criteria.  
[9Marks]
- b. Give 2 examples each of endangered, vulnerable and near threatened species in Ghana.  
[3 Marks]
- c. Define wetland 1) based on the type of vegetation and 2) based on Ramsar Convention. And explain the divisions under each definition. (8 marks)

*Examiner: Vivian Isabella Seshie*