



**UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA**  
**FIRST SEMESTER EXAMINATIONS, APRIL/MAY 2019**

**COURSE NO:** 172

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

**CLASS:** ES 1

**TIME:** 3 HRS

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

**Section A (50 marks)**

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

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1. 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
  
2. Benthic animals .....
  - (a) Are submerged in an area
  - (a) Are deep dwellers in the sea
  - (b) Are floating organisms
  - (c) Float on the sea surface
  
3. Water is a resource that is .....
  - a. Non-degradable and non-maintainable
  - b. Degradable and maintainable
  - c. Renewable
  - d. Non-renewable

4. What is true of ecosystems.....
- a. Primary consumers are least dependent on producers
  - b. Primary consumers outnumber producers
  - c. Producers are more than primary consumers
  - d. Secondary consumers are the largest and most powerful
5. Upper part of the sea/aquatic ecosystem contains .....
- a. Plankton
  - b. Nekton
  - c. Benthos
  - d. Plankton and nekton
6. The dominant second trophic level in a lake ecosystem is .....
- a. Benthos
  - b. Plankton
  - c. Zooplankton
  - d. Phytoplankton
7. .... Is the branch of science that studies all aspects of biodiversity with the goal of conserving natural resources?
- a. Human biology
  - b. Conservation biology
  - c. Agronomy
  - d. Wildlife management
8. Why is biodiversity desirable to humans .....
- a. For medicinal purpose
  - b. For agricultural diversity

- c. For consumptive use
- d. All the above

9. 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

10. 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

11. The average salinity in oceans is about .....

- a. 10 ppt
- b. 53 ppm
- c. 35 ppt
- d. 35 ppm

12. The term pelagic is derived from a Greek word which means .....

- (a) Well lit      (b) Open sea      (c) Bottomless      (d) Dead zone

13. Abyssalpelagic zone is at a depth of ...

- a. The 800-1400 m
- b. 1000-4000 m
- c. 200-1000 m
- d. (d) 4000-6000

14. Freshwater covers ..... of the earth's sur  
 a. (a) 0.80% (b) 0.47% (c) 0.35% (d) 0.75%
15. Sodium and chlorine make up ..... of the dissolved materials in the ocean.  
 a. 75% (b) 71% (c) 85% (d) 81%
16. The following are all stresses on aquatic ecosystems except .....  
 a. Light availability c. Temperature change  
 b. Native species d. Overharvesting
17. Which of the following is not an indirect value of biodiversity?  
 a. Participation in biogeochemical cycles c. Runoff from natural ecosystems pollutes sources of fresh water  
 b. Prevention of soil erosion d. Regulation of climate
18. What is the size range for sand sediment?  
 a. 0.06-2 mm c. 6.4-25.6 cm  
 b. 4-6.4 mm d. 2-4 mm
19. The term "Detritivore" includes:  
 a. Autotrophs c. Primary consumers  
 b. Decomposers d. Secondary consumers
20. What is happening to the amount of carbon dioxide in the atmosphere?  
 a. It is increasing  
 b. It is holding steady  
 c. It is decreasing  
 d. We have no way of knowing
21. The process of converting nitrate to nitrogen gas and nitrous oxide is called...

- a. Ammonification
  - b. Nitrogen fixation
  - c. Eutrophication
  - d. Denitrification
22. Which of the following chemicals enters living organisms primarily from the atmosphere rather than from rocks or soil?
- a. Calcium
  - b. Sodium
  - c. Phosphorus
  - d. Carbon
23. UMaT campus, including the buildings, grounds, students and all organisms living here could be considered a/an.....
- a. Population
  - b. Community
  - c. Ecosystem
  - d. Biosphere
24. Which of the following nutrients can be a limiting nutrient because of a plant's inability to use its gaseous form?
- a. Phosphorous
  - b. Nitrogen
  - c. Carbon
  - d. Hydrogen
25. Eutrophication .....
- a. causes algal blooms
  - b. is caused by runoff of nitrogen and phosphorous
  - c. results in massive fish kill
  - d. all of the above
26. The exchange pool in the carbon cycle is .....
- a. Fossil fuels
  - b. Sedimentary rock
  - c. The atmosphere
  - d. The oceans
27. A new city is built in an area with a large lake. The city primarily uses the lake as a major water supply for a variety of different city needs. This becomes a concern for environmentalists. Why are they concerned?
- a. Water is a renewable natural resource, but if they use it too fast, nature won't keep up.
  - b. Water is a non-renewable natural resource, so their supply is limited.
  - c. This kind of large-scale use of a water supply leads to increased greenhouse gasses.

d. This kind of a large-scale use of a water supply leads to increased soil erosion.

28. 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

29. Inorganic nutrients enter ecosystems by .....

a. Rainfall and wind

b. Immigration and emigration of animals

c. Way of global cycles

d. All of the above

30. The study of the ecosystem seeks to explain Asthenosphere is part of the Lithosphere.

**e.** The movement of material and energy through living communities

**f.** Succession development of ecosystems

**g.** Abundance and distribution of organisms

**h.** Biodiversity in the context of the environment

31. Which trophic level is incorrectly defined?

a. Carnivores – secondary or tertiary consumer

b. Decomposers – microbial heterotroph

c. Herbivores – primary consumer

d. Omnivores – molds, yeasts and mushrooms

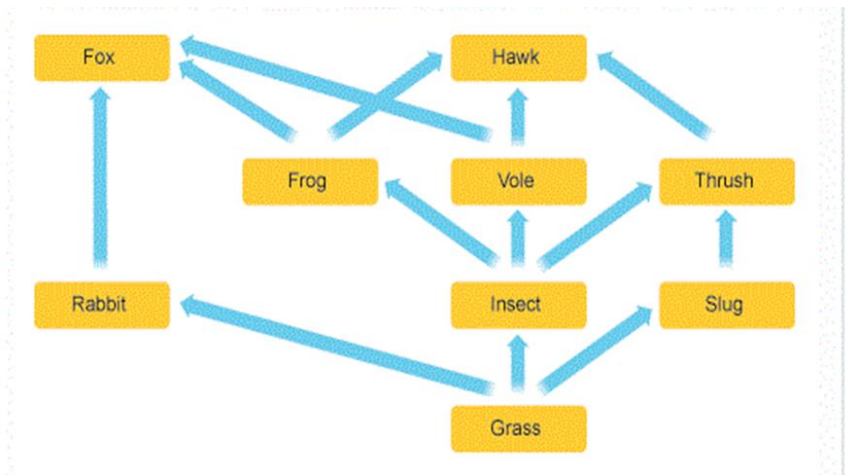
**Fill in the blanks with the right word**

32. Two (2) ways non-native species move into an ecosystem are ..... and .....
33. Species described as playing a critical role in maintaining the structure of an ecological connectivity, affecting many other organisms an ecosystem and helping to determine the types and numbers of various other species in the community is called .....
34. Human induced disturbances can be reduced by .....
35. Nourishment stand point consumers are subdivided into two groups----- A----- and--- ----- B----- .A is made up of ----- and B is made up of -----  
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36. Within the food web, the sequence of consumer steps from organism to organism is referred to as .....
37. Pelagic of the freshwater ecosystem is opposite of the ..... And the photic/limnetic zone of the marine ecosystem is the .....
38. Lentic freshwater ecosystem (pond) are divided into ....., ....., and .....
39. Lotic major zones in a river ecosystem are determined by the river bed's .....
40. There is degradation of an aquatic ecosystem when there is .....
41. What factors reduces the amount of dissolved oxygen is freshwater ecosystem....., ..... and .....

## SECTION B

ANSWER QUESTION ONE (1) AS A COMPULSORY QUESTION AND ANY OTHER ONE (1)

### Question One [Total of 20 Marks]



- What happens if the population of slugs decreased? [3 marks]
- What happens if the population of insects decreased? [3Mark ]
- What happens if the grass die? [3 Mark ]

2. Differentiate between the following; [1 Mark each]

- Ecosystem and ecology
- Spatial scale and temporal scale
- A community and a landscape
- biotic component and biotic factor
- predator food chain and parasitic food chain
- ecological concept and ecological resilience
- Conservation and Preservation
- Endangered and Critically endangered species
- Native Species and Keystone species
- Hotspot and Endemic species
- Panarchy and Ecological Niche

**Question Two [Total of 30 Marks]**

- a. What is variation? [3 Mark]
- b. Name and explain the causes of genetic variation. [6 Marks]
- c. There is a sixth mass extinction that has begun, state clearly why it is different from the previous ones and explain the 5 major activities that have contributed to the decline of biodiversity under the sixth mass extinction. [7 Marks]
- d. Explain and describe the disturbance of hydro-power and irrigation projects on the aquatic environment [5 Marks]
- e. How does ecotourism differ from conventional tourism and how does ecotourism conserve biodiversity? [6 marks]

**Question Three [Total of 30 Marks]**

- a. Latitudinal gradient in species richness and the relationships between local and regional richness helps in the understanding of the distribution of biodiversity. Explain the distribution of biodiversity. [10 Marks]
- b. Outline any 5 practical differences between people who are primarily concerned with conservation and those concerned with economic development. [5 Mark]
- c. Give 4 reasons why the tropics are highly species. [2 Marks]
- d. Explain and describe the disturbance of hydro-power and irrigation projects on the aquatic environment. [4 Marks]
- e. Give 2 examples each of endangered, vulnerable and near threatened species in Ghana. [3 Marks]
- f. Define wetland 1) based on the type of vegetation and 2) based on Ramsar Convention. And explain the divisions under each definition. (7 marks)

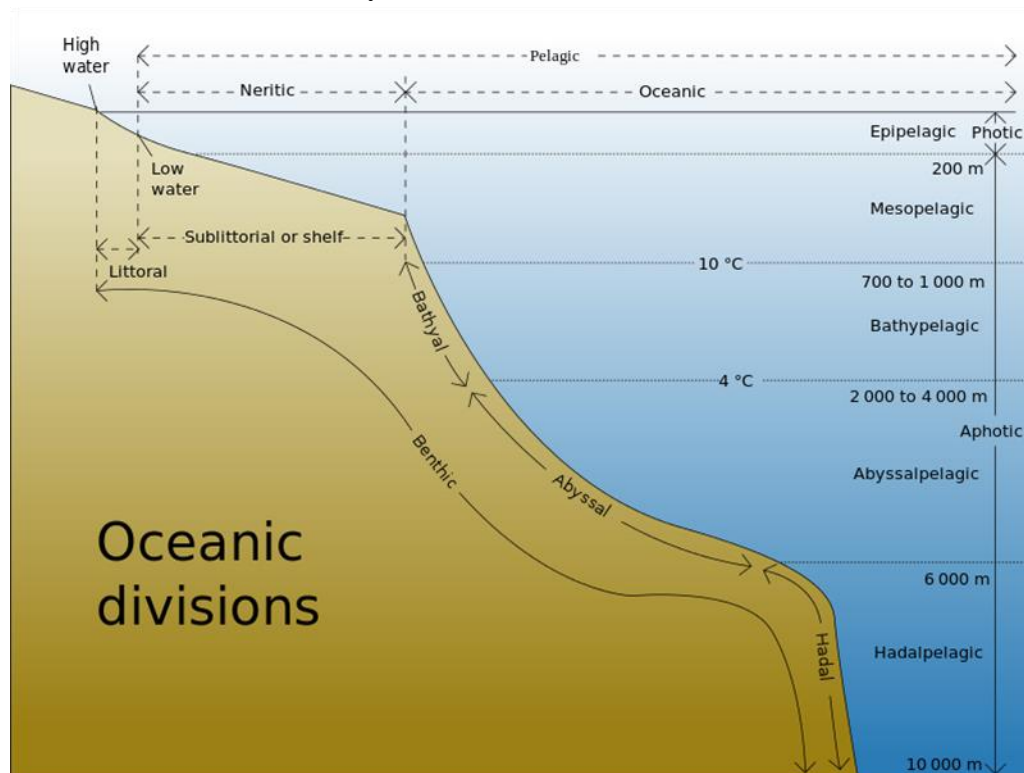
**Question Four [Total of 30 Marks]**

Fill in the Criteria for the new criteria for classification under the IUCN [8 Marks]

Abb.	Category	Criteria
EX	Extinct	
EW	Extinct in the wild	
CR	Critically Endangered	

EN	Endangered	
VU	Vulnerable	
NT	Near Threatened	
LC	Least Concern	
DD	Data Deficient	

- List all the names of the five mass extinction that has occurred and state two examples each of the possible causes of the extinction. **[5 Marks]**
- State the difference between the consumptive and environmental service values and give three examples each. **[6 Marks]**
- Differentiate Upland and lowland rivers. Give four differences. **[2 Marks]**
- Name and state why human is considered as one greatest single species to cause the sixth mass extinction. **[5 Marks]**
- 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. **[12 marks]**



**GOODLUCK (MISS SESHIE)**

Examiner: Vivian Isabella Seshie