

THE OPEN UNIVERSITY OF SRI LANKA

M.Sc. In Environmental Sciences Level 10 (2019)

ZYPA 602 Biodiversity Conservation and Management

OBT 1

Date: 08th September 2019

Time.13.00 hrs -14.30 hrs

Answer any three (03) questions

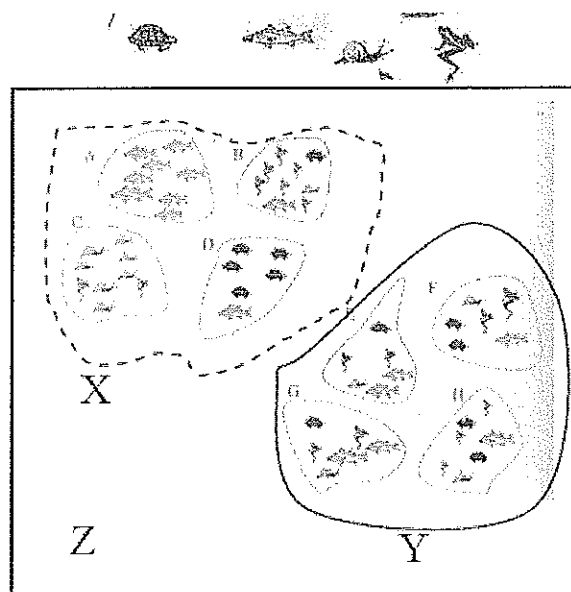
Question 1

- Define in simple terms “ Sri Lanka’s Biological Diversity” in one sentence.
- Name and briefly describe the three levels of biological diversity that is commonly used.
- Explain briefly how these three levels are inter-related using example/s from Sri Lanka.
- Explain briefly what is meant by conserving biological diversity, showing why conservation should address all three levels of biological diversity, using the cheetah as an example.
- Explain briefly how taxonomic diversity and taxonomic uniqueness can be used to assess the importance of biological diversity in an area.

Question 2

The diagram given below shows several ponds in two forests (occurring within area Z). They contain fish, amphibians, freshwater turtles and gastropods:

- List the ponds in Forest X in terms of declining species richness and explain briefly how you did this.)
- Which of the forests (X or Y) has greater species richness if that is the case? Explain.
- Which of the two forests has highest beta diversity if a researcher sampled each of the ponds in the following order ?
Forest X: A, D, C, B
Forest Y: E, H, F, G.



Cont .7

- (d) Define what is meant by alpha and beta diversity using the two forests in Area Z as examples.
- (e) Explain which of the ponds in forest X has highest taxonomic diversity.
- (f) Identify the best method to be used to measure species richness in the two forests during one day survey. Describe the method briefly.

Question 3:

Your niece has watched a film clip which described a biome thus:

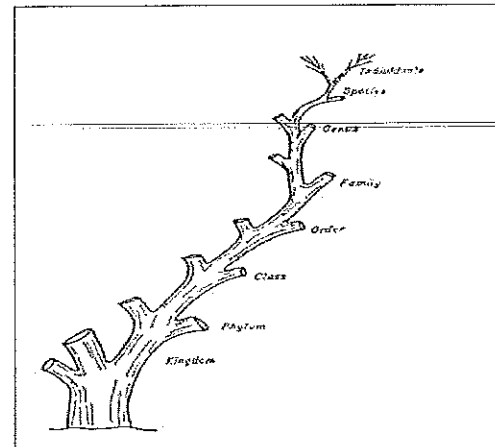
“Spring in a woodland is special. With no leaves overhead the sun’s rays strike the earth directly and rouse the plants from their winter sleep. The ground living plants are in a hurry because before long the trees will come into leaf and steal their light. Within a few weeks the canopy closes and only a few shafts of light will penetrate the woodland. The leaves expand to their full size to make the most of summer while it lasts. In a few months, the days begin to shorten and great tracts of forests flush red...”

- (a) What is the name of the biome that is being described? Justify your answer, in terms of:
- The most defining feature of trees in this biome?
 - What is meant by ‘ground dwelling plants are in a hurry before the trees steal their light?’
 - Why leaves of trees grow to full size to make the most of summer while it lasts?
- (b) Where does this biome occur on earth in terms of latitudes, and in which continents of the world?
- (c) List the main features of this biome in point form (e.g. Rainfall, temperature, tree height and structure of the forest). What are the ecological features that have given rise to the defining feature of this biome?
- (d) What is the name of the biome that occurs immediately north of the biome described in the clip?
- (e) How do the leaves in the more northern biome differ from the one described in the film clip? What is the basis for this difference in the northern biome?
- (g) Give three examples of tree genera (scientific /common names) found in the biome described in the film clip.
- (h) Which of the following animals are commonly found in the biome described in the film clip?: Lions, black bear, wolves, polar bear, mountain lions, caribou. Name the biomes in which the other species are commonly found.

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Question 4

- (a) Describe the diagram given below, and indicate where the other intermediate taxonomic levels currently in use should be placed.
- (b) What is the relevance of binomial classification when studying biological diversity and comparing the species richness of two areas? Explain briefly.
- (c) The type specimen for the western purple-faced langur is lodged in the British Natural History Museum in London. If so, where is the holotype? What is meant by the terms holotype and paratype for this langur?
- (d) Your nephew wants to know how type specimens may become important when assessing species diversity of a given area. Explain briefly.
- (e) What are tautonyms in nomenclature? Which International Code of (Zoological or Botanical) Nomenclature permits the use of tautonyms? Give an example if its use.
- (f) What ecosystem is believed to be the most diverse in terms of higher taxonomic diversity such as phyletic diversity, exceeding even tropical forests?



Question 5

Organisms have been divided into Kingdoms that show a great diversity of life forms. While the 5 kingdom classification was in use for many years, organisms are now divided into 6 Kingdoms due to the splitting of the Kingdom Bacteria into two (bacteria and Archae).

- (a) What are the other four Kingdoms of life?
- (b) Describe very briefly the diversity of life forms (at phyletic level) among the group commonly known as algae. List one main difference that helps differentiate these phyla.
- (c) Are water 'molds' true fungi? Explain your answer giving cell wall composition and habitats occupied as examples. Which group is more diverse in terms of species?

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- (d) Slot in the following plant groups/genera listed in column A, into Column C to indicate examples for the plant divisions in Column B (duplicate columns B and C in your answer scripts):

A	B (Plant Division)	C Example
<i>Eucalyptus</i> , <i>Gingo</i> , <i>Ephidra</i> , <i>Orchids</i> , Larch (<i>Laryx</i>), <i>Cycas</i> , firs (<i>Abies</i>), <i>Pinus</i> , <i>Welwitschia</i>	Cycadophyta	
	Coniferophyta	
	Gnetophyta	
	Gingophyta	
	Anthophyta	

- (e) What is the most diverse plant division in terms of species among the vascular plants?
 (f) What plant groups (from those in column A above) may be found in the Taiga?
 (g) What plant species has individuals that are about a 2000 years and has only two leaves?