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RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
Second Year - Semester II Examination – November/December 2016

BIO 2203 – ECOLOGY

Time: Two (02) hours

Answer any four (04) of the following questions.
Illustrate your answers with suitable diagrams where appropriate.

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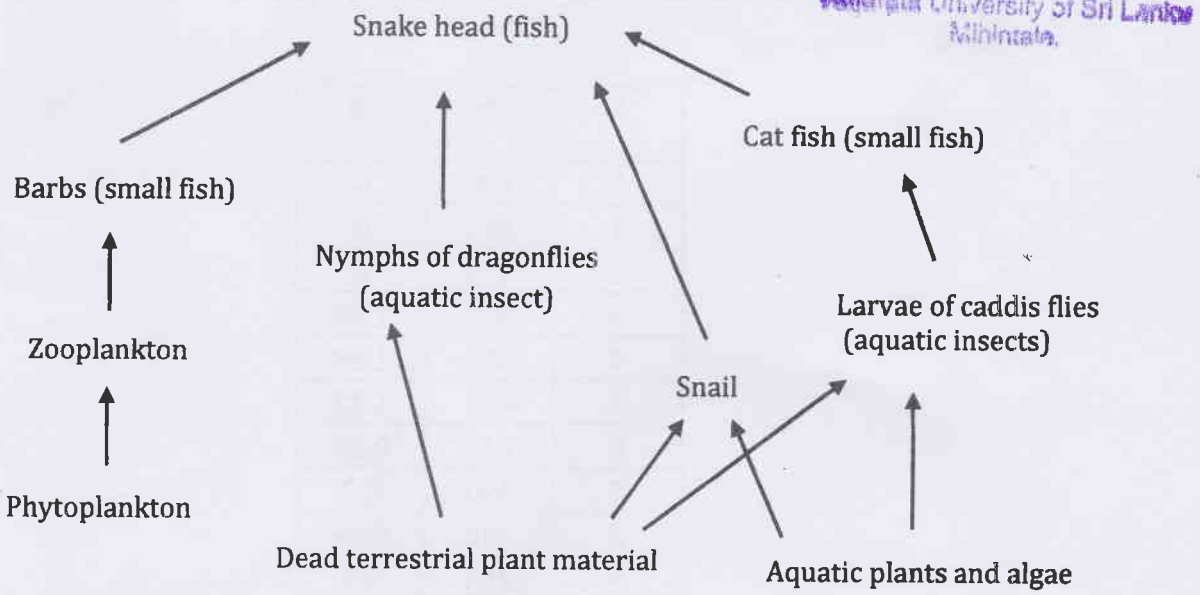
1. Interdependence in nature is illustrated by the transfer of energy through trophic levels. The diagram below depicts the transfer of energy in a food web of a freshwater lake located in Anuradhapura.



a) Selecting organisms belonging to **four** different trophic levels, from the above food web as examples, explain how energy is obtained at each trophic level.

b) Describe the efficiency of energy transfer between the trophic levels and discuss how the amount of energy available at each trophic level affects the structure of the ecosystem.

c) If cells of the dead terrestrial plant material which got washed into the lake, contained a commercially produced toxin, what would be the expected impact on the food web?

2. a) What are biogeochemical cycles?

b) List the importance of biogeochemical cycles in nature.

c) Discuss how various types of organisms and their biochemical reactions in an ecosystem, contribute to the recycling of nitrogen cycle, with special reference to their negative impacts

3. A study was conducted on a population of female Nilgai Antelope in a savanna ecosystem. The Cohort Life Table for this Female Nilgai Antelope population (x = years) is as follows.

x	nx	m
0	608	0
1	487	0
2	480	0
3	472	1.86
4	465	1.68
5	447	1.22
6	419	0.93
7	390	0.7
8	346	0.69
9	268	0.3
10	154	0.05
11	59	0
12	4	0
13	2	0
14	0	0

a) Calculate the net reproductive rate of this population.

b) Construct a life table for this antelope cohort and find how many more years a female antelope at age 3, is expected to live and her age at death.

c) Draw a survivorship curve for this cohort.

d) State your conclusion on the life history of this population and briefly explain its growth characteristics

4. "Resource limitation is necessary for the occurrence of competition." Justify this statement using suitable examples from both aquatic and terrestrial environments.

5. Write short notes on the following;
   a) symbiotic associations that exist in nature
   b) concepts of fundamental and realized niches
   c) ecological succession
   d) importance of soil for plant growth

END