RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
Second year – Semester II Examination – April/May 2016

BIO 2203 – ECOLOGY

Time: Two (02) hours

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

1. a) Describe the carbon cycle emphasizing on each step.

   b) Explain how the carbon molecule enters and leaves the living system with special reference to the role of microorganisms and reservoir for carbon in the cycle.

   c) Discuss the impacts of human activity on the carbon cycle and its contribution for the global warming.

2. a) Define ecological niche and differentiate the fundamental niche from the realized niche.

   b) "Coexistence" is a situation where two closely related species are found in the same habitat. Explain how the resource partitioning permits this situation to occur.

   c) Using examples from both plants and animals, elucidate the strategies that prey species adopt for survival.

3. Dr. Oleg, an overworked freshwater ecologist, studied the density and age structure of bluegill (sunfish) in Big Lake over the last five years. He has estimated the annual survival of bluegill of different ages. Results are as follows.

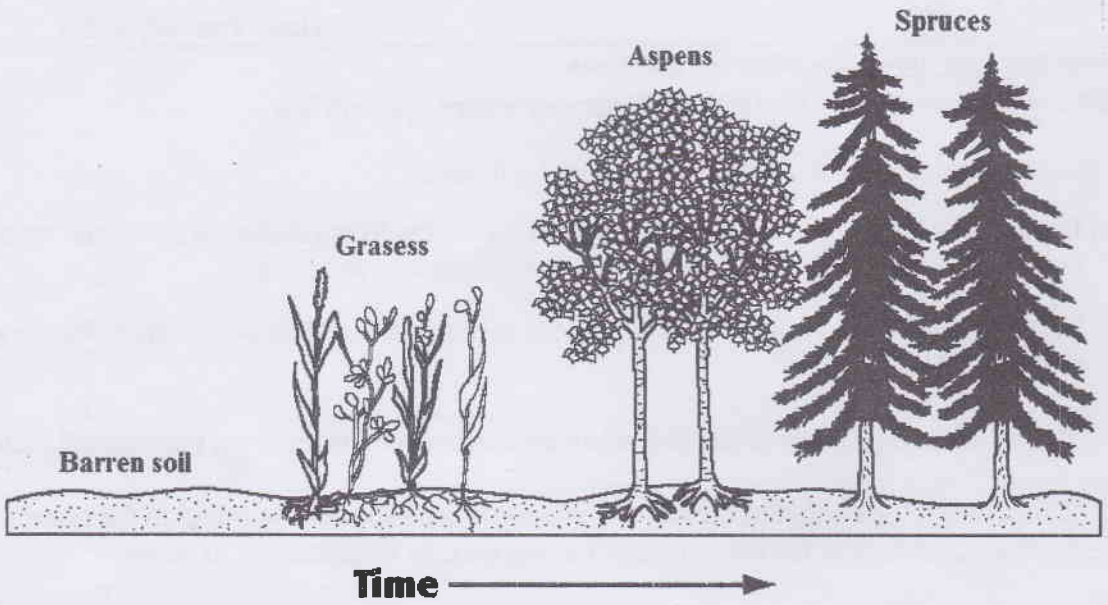
   Annual survival from birth to age 1 : 0.8
   Annual survival from age 1 to age 2 : 0.8
   Annual survival from age 2 to age 3 : 0.5
   Annual survival from age 3 to age 4 : 0.5
   Annual survival from age 4 to age 5 : 0.0

   a) Unfortunately, Dr. Oleg was recently institutionalized, and you (being his only student) have been asked to take over the project. Using the above information, calculate the survivorship schedule for this fish population. (Consider l0 = 1.0)

b) Dr. Oleg's lab book also contains data on the fecundity of bluegill. Using the following fecundity schedule, calculate the net reproductive rate (R0) of bluegill.
$m_0 = 0, m_1 = 0, m_2 = 1, m_3 = 1, m_4 = 2$

c) Will this population increase or decrease through time ?

4. The following diagram illustrates succession in a plant community which was a mature forest community is completely destroyed by fire. Study the diagram and answer the questions.



a) Define the term succession.

b) Describe the stages of succession by which this community is restored.

c) Tabulate the differences between primary and secondary succession.

d) Using suitable examples, briefly explain the importance of succession for the balancing of an ecosystem.

5. Write short notes on the following.

a) Different types of maritime vegetations in Sri Lanka

b) Energy flow between trophic levels

c) Key components of soil and its role in plant growth