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00617

THE OPEN UNIVERSITY OF SRI LANKA

B. Sc. DEGREE PROGRAMME - LEVEL 4

FINAL EXAMINATION- 2017/2018

COURSE TITLE: FUNDAMENTALS OF ECOLOGY

COURSE CODE - ZLU2281

DURATION - 3 HOURS



INDEX NUMBER .....

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DATE: 15.01.2018

TIME: 1.30PM-4.30 PM

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QUESTION PAPER CONSISTS OF TWO PARTS, PART "A" AND PART "B".

ANSWER QUESTION 1 FROM PART "A" AND ANY FOUR QUESTIONS FROM PART "B".

PLEASE NOTE THAT QUESTION 1 IS COMPULSORY AND THE ANSWERS SHOULD BE WRITTEN IN THE SPACE PROVIDED.

## PART "A"

## QUESTION 1

1.1.

a) Define the terms population and population growth.

Population.....

.....

Population growth.....

.....

b) What are the major forces that influence the population growth in closed and open populations?

Open.....

Closed.....

1.2. Two major population growth models have been derived by Lotka and Volterra, for discrete generations and overlapping generations. Explain these models briefly with examples.

Discrete generations	Overlapping generations

1.3) Illustrate the population growth of populations showing different  $R_0$  values,  $R_0 = 1.5, 1.2, 0.9$ .

1.4 With sufficient resources in a particular environment a population showed a rapid growth rate. However, after some time, resources became limited and the growth rate changed. Which type of growth curve would you expect to have for this population? Draw the growth curve with the relevant equation and explanation.

1.5. Complete the table below for determining the population size of four different populations.

Methods				
	1	2	3	4
Method				
Example				
Brief explanation (give in point form)				

1.6 a) What is meant by the “age structure of a population”?

.....  
.....

b) List the importance of determining the age structure of a population of organisms.

- 1.....
- 2.....
- 3.....
- 4.....

c) Draw age pyramids of human populations to demonstrate:

i) Increasing growth

ii) Decreasing growth

iii) Zero growth

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1.7 Draw the types of survivorship curves found in nature and explain them briefly

## PART "B"

ANSWER ANY FOUR (04) QUESTIONS

2. i) Discuss the productivity of ecosystems.  
 ii) Explain the two major food chains found in nature.  
 iii) Considering 2(ii) above draw a fully labeled energy flow diagram and explain in detail.
3. Explain the main process of a sedimentary cycle which shows the association with eutrophication.
4. i) List the main categories of predation and explain them briefly.  
 ii) Explain the Lotka and Volterra proposed model for prey-predator interactions using graphical representation and relevant equations.
5. i) Give three different definitions of niche including Odum's and Hutchinson's concepts.  
 ii) When considering the niche of a species, what are the different (sub) categories of niches we must know about a particular species.  
 iii) Discuss the niche of a fish species found in an estuarine environment related to the Hutchinson's concept and tolerance levels.
6. The extensive coast that surrounds Sri Lanka possesses different type of ecosystems, where organisms show specific adaptations to survive in deprived climatic conditions".  
 i) List the three (03) major types of maritime ecosystems of Sri Lanka.  
 ii) What are the special climatic and edaphic factors shown by the each maritime ecosystem listed above.  
 iii) Briefly describe relevant adaptations process by each plant species in each maritime ecosystem.  
 iv) Explain the process of the "cyclic vegetational change" shown by one of the above mentioned maritime communities.
7. Write short notes on **any three** of the following.
- |  |                    |
|--|--------------------|
| a) Green house effect.                     | b) Transition zone |
| c) Density dependant population regulation | d) Biosphere       |

