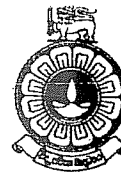THE OPEN UNIVERSITY OF SRI LANKA

B. Sc. DEGREE PROGRAMME - LEVEL 4

FINAL EXAMINATION– 2015/2016

COURSE TITLE: FUNDAMENTALS OF ECOLOGY

COURSE CODE – ZLU2281

DURATION – 3 HOURS

INDEX NUMBER ....

DATE: 08.01.2017   TIME: 9.30AM-12.30 PM

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 WRITTTEN IN THE SPACE PROVIDED.

PART "A"

QUESTION 1

1.1. Define the terms "**community**" and "**species guilds**".

a). Community ....

....

b) Species guilds ....

....

1.1.1 List the three main factors that determine the community organization..

i .... ii..

iii..

1.1.2 Explain the above factors in 1.1.1 briefly.

i).

....

....

ii)

....

....

....

iii)

....

....

1.1.3 Community characteristics arise as a result of a number of populations assembling together in a particular space. List these community characteristics.

i .... ii...

iii.................................... iv...

v..

1.1.4) With suitable labeled diagrams briefly explain (i) and (ii) given below.
   (i) Vertical Stratification of terrestrial communities

(ii) Stratification of aquatic communities.

1.1.5) Fill the six blank columns given in Table 1 and calculate the diversity for community A and B using **Shannon Wiener Diversity Index. (Please Note**: The Ln values needed for your calculation are given below.)

Table 1:

	No of individuals		Pi A	Pi B	Lnpi A	Lnpi B	....	....
	Community A	Community B						
Species 1	3	10						
Species 2	0	20						
Species 3	1	5						
Species 4	6	10						
Species 5	0	5						
							$\sum$......	$\sum$.....

Value pi	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Lnpi	-2.3	-1.6	-1.2	-0.9	-0.7	-0.5	-0.4	-0.2	-0.1

i) Diversity of community A (H_A) =

  Diversity of community B (H_B) =

ii) Give your opinion on the above results in (i) (diversity of both communities)

....

iii) Name the dominant species for each community (A and B) given in Table 1.

    Community A ....

    Community B ....

1.2 a) What do you mean by the transition zone?

....

b) Name the two types of transition zones.

....

c) Explain the above two transition zones given in 1.2.b) briefly.

....

....

....

d) Species distribution in a typical transition zone between a forest (X) and grassland (Y) may contain groups of species. Identify the relevant three groups of species.

i..

ii..

iii..

e) Regarding above1.2d), forest (X) and grassland (Y) communities, draw the relevant diagrammatic representations A- D in the spaces given below.

A-Ideal ecotone development where plants from both communities invade each other to create a wide ecotone X^2Y^2.

B-Narrow ecotone developed by the advance of community Y into community X.

C-Abrupt, narrow edge with no development of an ecotone.

D-Community X advances into community Y to produce ecotone XY.

A	B
C	D

4

PART "B"

ANSWER ANY FOUR (04)) QUESTIONS

2. Discuss the niche "concepts" and "niche dimensions"

3. Write an essay on biogeo-chemical cycles and human impacts.

4. Explain the Lotka and Volterra proposed model for inter-specific competition using graphical representation and relevant equations.

5. i) Describe the type of food chains present in an ecosystem and illustrate a food web for a grassland community.

   ii) Determine the trophic status of each species in the above 5 (i) food web and explain the types of ecological pyramids.

   iii) Explain the methods that you can use for the construction of food webs.

6. i) Name the main climatic zones in the world and the relevant ecosystems which are included into each zone.

   ii) Briefly explain how different climatic factors influence the distribution of major ecosystem types in the world.

   iii) What are the climatic or edaphic factors which govern the distribution of plant community types in Sri Lanka.

   iv) Giving appropriate examples, outline the major ecosystems found in various climatic zones of Sri Lanka.

7. Write short notes on **any three** of the following.

   a) Continental drift.

   b) Broad and narrow tolerance curves.

   c) Exponential population growth.

   d) Age structure and age pyramid.