UNIVERSITY OF RUHUNA
BACHELOR OF SCIENCE (SPECIAL) DEGREE LEVEL I (SEMESTER I) EXAMINATION – AUGUST 2017

SUBJECT: Advanced Ecology **COURSE UNIT: BOT 4013**

Time: Two Hours

Answer **ONLY Four** questions including question **number ONE.**

1)

i) Briefly, explain the main purpose of using "multivariate techniques" in plant ecology.

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(10 marks)

ii) Name "three major techniques" that are commonly used in multivariate data analysis, to perform data reduction in complex ecological data sets

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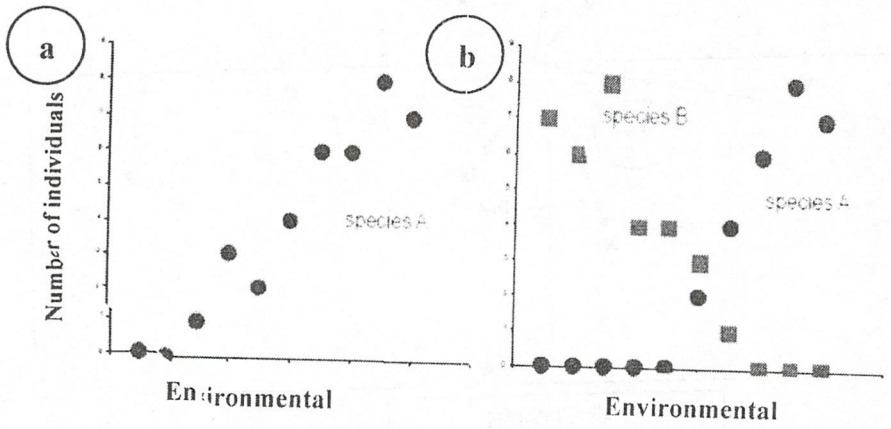
(6 marks)

(iii) The given graphs (a) and (b) show the species responses (species A & B) to the environmental gradient. Justify the most realistic species response/s in the environment.



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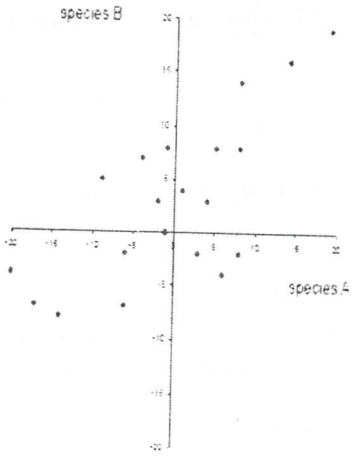
(14 marks)

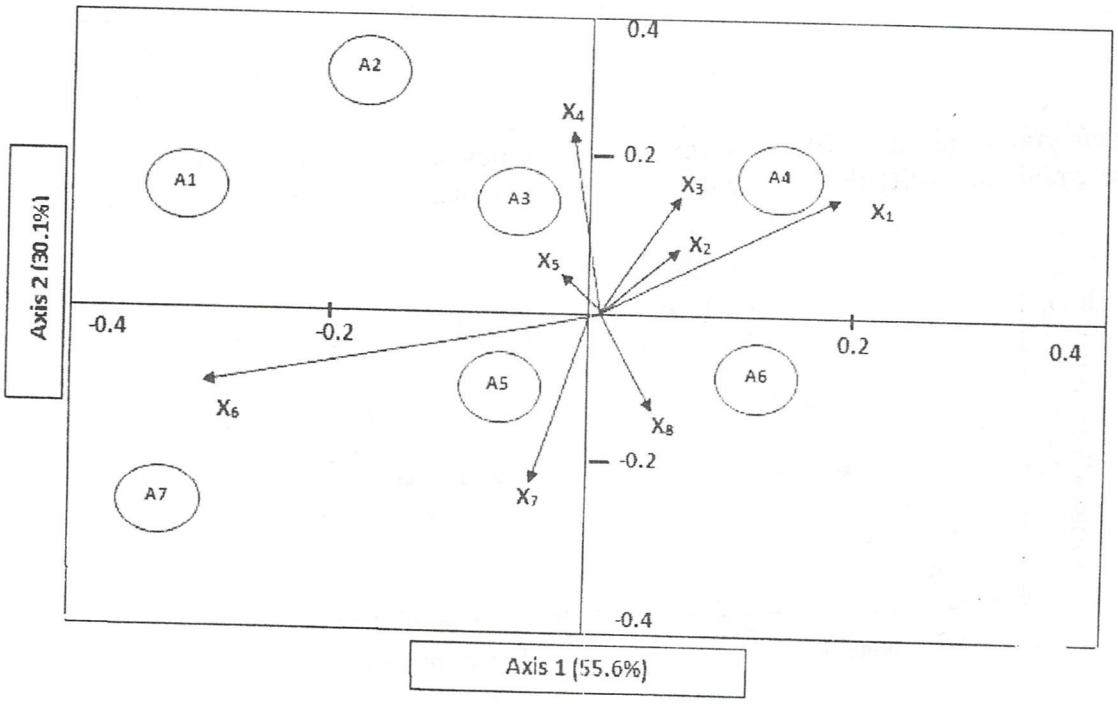
(iv) Draw the direction of "first two ordination axes" on the given graph, to show the maximum variation in the species data.



(10 marks)

(v) PCA bi-plot which contains both species and sampling sites is given below.

X_1 to X_8: species; A_1 to A_7: sampling sites



(a) Is it accurate enough to use the given two ordination axes in studying the variation in the species data set. Explain your answer.

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(10 marks)

(b) Giving suitable examples, describe the interaction between the following species.

X_1 & X_3

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(10 marks)

X_2 & X_6

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(10 marks)

X_1 & X_8

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(10 marks)

(c) Arrange the sampling sites in descending order, considering the abundance of species "X_4" in each sampling site.

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(14 marks)

(d) When considering the species distribution, which sampling site is more similar to "A_5"?

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(6 marks)

2) Discuss the problem whether plants show a resistance against herbivore or not.

3) Write short notes on following.

i) Ecological succession

ii) Mutualism

iii) Flagship species

iv) Tundra forest

4) Briefly explain the effects of climate change on the ecological features of tundra and desert biomes.

5) A)

i) What do you mean by "a biome"?

(10 Marks)

ii) List the major terrestrial biomes.

(5 Marks)

iii) What are deciduous trees?

(15 Marks)

iv) Briefly explain the method of estimating the cover of mosses on a substrate by using a "frame of pins".

(40 Marks)

B)

The table 1 includes few parameters which were calculated in an ecological study, relevant to a grass species. Answer the following questions, by using those data.

Relative Frequency	70 %
Relative Density	50%
Relative Dominance	60%

i) Calculate the "Importance Value Index" (IVI value).

(10 Marks)

ii) Draw a phytograph for the above data.

(20 Marks)