**BCB743 Quantitative Ecology practical Total 96 marks**

**Question 1 (2 marks)**

Specify the dimensions of the three data sets.

**Question 2 (6 marks)**

1. Provide a plot on Cartesian (spatial) coordinates of a) the species richness, the b) Shannon-Weaver, and c) the Simpson’s Index.
2. Explain each figure using your knowledge of how the ‘landscape was created’.

**Question 3 (8 marks)**

1. Calculate an association matrix for the species data. (1)
2. Produce a plot that is suitable for showing the kinds of information contained in the association matrix. (3)
3. Briefly describe a few of the more ‘obvious’ positive and negative species associations. If possible, add an ‘ecological’ explanation for why this is so. (4)

**Question 4 (20)**

1. Undertake a PCA on the species data. Comprehensively explain the various (all) components of the summary() of the PCA object. (20)
2. Provide plots of the PCA. How many axes must be retained, and why? What patterns become visible from the biplot? Explain your findings in detail. (10)

**Question 5 (10)**

1. Undertake an NMDS on the species data, and provide plots of the NMDS. (2)
2. What patterns become visible from the ordination plot? Explain your findings in detail. (10)

**Question 6 (40)**

1. Do a constrained analysis on the data, and comprehensively explain all the findings as per the of the summary() of the NMDS object. (20)
2. Run the necessary permutation tests. Explain the outcomes. (6)
3. Produce the necessary biplots. Explain the findings. (14)

**Question 7 (10)**

Write down your understanding of the ‘ecology’ of the landscape that was sampled and analysed in the various steps, above.