



**RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES**

**B.Sc. in Applied Sciences
Second Year – Semester II Examination – September / October 2020**

BIO 2201 – SYSTEMATIC BIOLOGY

Time: Two (02) hours

Answer FOUR (04) questions including question no. 01 and 02.

1. a) Briefly state how phylogenies are used in classification. **(15 marks)**
- b) Give three (03) advantages of using DNA sequences for phylogeny reconstruction. **(15 marks)**
- c) What are the two (02) main categories of analytical methods used in phylogeny construction using DNA sequences? **(10 marks)**
- d) The following is a distance matrix from an alignment of DNA sequences from four species.

	Species P	Species Q	Species R	Species S
Species P	-	0.2	0.4	0.6
Species Q		-	0.5	0.7
Species R			-	0.8
Species S				-

Construct a UPGMA tree using the above distance matrix. Indicate all steps in calculations. Make sure to draw the dendrogram to scale in the provided graph paper. **(50 marks)**

- e) Provide one (01) advantage and one (01) disadvantage of the above analytical method. **(10 marks)**

2. a) Describe briefly the term ‘dendrogram’ in numerical taxonomy? **(15 marks)**
- b) State **five (05)** specific epithets in plants explaining how they have been derived according to International Code of Nomenclature (ICN). **(35 marks)**
- c) State **two (02)** common methods of drying plant material in making dry herbarium specimens. **(05 marks)**
- d) Give **one (01)** advantage and **one (01)** disadvantage of each method stated in (c) above. **(20 marks)**
- e) Define the term “DNA barcode” of a plant species. Giving an example, explain briefly the importance of barcoding economically important plants. **(25marks)**
3. Justify the following statements.
- a) “Plant Systematics is a subject with never ending synthesis and with a multiple role in biology”. **(40 marks)**
- b) “Foreign scientists made a commendable contribution to the development of Plant Systematics in Sri Lanka”. **(60 marks)**
4. a) Explain the possibility of using **three (03)** plant remains in criminal investigations. **(30 marks)**
- b) Describe giving examples, the different methods of author citation in Plant Taxonomy. **(70 marks)**
5. Discuss the use of palynological evidence (pollen grain characters) as a source of evidence in plant taxonomy. **(100 marks)**

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