RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
First Year – Semester II Examination – November/December 2016

BOT 1202 – FUNCTIONAL PLANT ANATOMY AND BASIC WOOD SCIENCE

Time: Two (02) hours

Answer any four (04) questions.

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1. Plants are comprised of an assortment of tissues, regardless of their size.
   a) What is meant by a **plant tissue**, a **simple plant tissue** and a **complex plant tissue**? (15 marks)
   b) Provide **five (5)** evidences to prove that the epidermis of plants is a complex tissue. (20 marks)
   c) Stating **ten (10)** anatomical variations in epidermal cells, confirm that the epidermis performs a variety of functions. (50 marks)
   d) State how root hairs deviate anatomically from typical epidermal cells and briefly relate the difference/s you mentioned with their function/s. (15 marks)

2. Wood has been used for millennia for many purposes, while the grain of a wood is a key aspect in wood work.
   a) State briefly what wood grain is and justify that the different grains can be obtained from wood of different trees of a same plant species or even from wood of a single tree. (35 marks)
   b) The wood of fairly old trees of Arecanut, Coconut, and Fishtail-palm (Kithul) and Palmyrah is hard, strong and durable and is generally used for roofing and other purposes. Reason out briefly how they achieve their hardness. (20 marks)
   c) Distinguish between the following pairs.
      i. Heartwood and sapwood
      ii. Hardwood and softwood
      iii. Earlywood and latewood (45 marks)

3. "Diversity, distribution and arrangement of xylem parenchyma is a promising microscopic tool in identification and confirmation of wood." Validate the statement. (100 marks)

4. A covering of trichomes on any part in shoot system of plant is referred to as an indumentum.

   a) Describe briefly, the different criteria used in description and classification of plant trichomes. (50 marks)

   b) Explain, giving **ten (10)** evidential examples, that the trichomes are essential in plant life. (50 marks)

5. Leaf is the principal lateral appendage of the stem of vascular plants.

   a) Depending upon the distribution of stomata on the surfaces of leaves, following categories of stomatal distribution have been recognized; namely, Hypostomatic, Amphistomatic, Epistomatic and Astomatic. Indicate the possible type of stomatal distribution in (i) *Hydrilla*, (ii) Jack, (iii) Maize, (iv) *Nymphaea*, (v) *Potamogeton*, (vi) Rice, (vii) Teak, and (viii) *Vallisneria*. (40 marks)

   b) Illustrate, using labeled simplified diagrams only, the **six (6)** basic types of stomata. Consider their subsidiary/accessory cells and/or neighboring ordinary epidermal cells. (30 marks)

   c) With the aid of a line diagram/s, briefly demonstrate how the anatomy of circular leaf of onion (*Allium cepa*) deviates from that of a typical monocotyledonous leaf. (30 marks)

END