Index No.: .....

RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences
First Year – Semester I Examination – September/October 2019

BOT 1202 – FUNCTIONAL PLANT ANATOMY AND BASIC WOOD SCIENCE

For official use Only					
Marks					
Question 1	Question 2	Question 3	Question 4	Question 5	Total

Time: Two (02) hours

Answer ALL compulsory questions and ONE (01) of the optional questions.

Compulsory Questions: [Approximate time allocation is **one and half (1 ½) hours**]

1. Answer **ALL** questions. **Underline** the **most suitable answer** using a **pen**. **(100 marks)**

   a) Cortex is the region found between
      i. epidermis and stele.
      ii. pericycle and endodermis.
      iii. endodermis and pith.
      iv. endodermis and vascular bundle.

   b) In gymnosperms (except in *Gnetum*), xylem is made up of
      i. tracheids and vessels.
      ii. vessels and fibres.
      iii. tracheids and parenchyma.
      iv. vessels and parenchyma.

   c) A major characteristic of typical monocot root is the presence of
      i. scattered vascular bundles.
      ii. closed vascular bundles.
      iii. cambium sandwiched between phloem and xylem along the radius.
      iv. open vascular bundles.

d) Which of the following combinations of vessel element characteristics are important for the movement of water in the xylem?
   i. Rigid cell walls, cell death at maturity, end walls absent.
   ii. Rigid cell walls, reduction in size of plastids and mitochondria, end walls present.
   iii. Rigid cell walls, living cell membranes, end walls absent.
   iv. Flexible cell walls, cell death at maturity, end walls absent.

e) Presence of conjoint collateral closed vascular bundles are evident in the stem of
   i. apple.
   ii. coconut.
   iii. mango.
   iv. teak.

f) Select the tissue which is generally absent in typical aerial roots.
   i. Chlorenchyma
   ii. Collenchyma
   iii. Sclerenchyma
   iv. Parenchyma

g) Interfascicular cambium develops from the cells of
   i. endodermis.
   ii. pericycle.
   iii. medullary rays.
   iv. xylem parenchyma.

h) Which of the following is true?
   i. Tracheids are unicellular with wide lumen.
   ii. Vessels are unicellular with narrow lumen.
   iii. Tracheids are multicellular with narrow lumen.
   iv. Vessels are multicellular with wide lumen.

j) The major function of sieve tubes in plants is
   i. mechanical support.
   ii. translocation of organic solutes.
   iii. translocation of water and minerals.
   iv. food storage.

n) A bicollateral vascular bundle is one
   i. which has either a phloem strand or a xylem strand.
   ii. in which both xylem and phloem are present with the xylem towards the centre.
   iii. in which both xylem and phloem are present with the xylem towards the periphery.
   iv. in which both xylem and phloem are present with the phloem on both sides of the xylem.

k) Alternation of long cells with pairs of short cork and silica cells are seen in the epidermis of the stems of
   i. cotton.
   ii. potato.
   iii. sugarcane.
   iv. grape.

Index No.: .....

l) Cell division occurs in all planes in
   i. file or rib meristem.
   ii. plate meristem.
   iii. mass meristem.
   iv. apical meristem.

m) Bulliform cells can be seen in the leaf epidermis of
   i. *Nymphaea nouchali*
   ii. *Oryza sativa.*
   iii. *Dipterocarpus zeylanicus.*
   iv. *Mesua ferrea.*

o) With reference to bark, select the incorrect statement? It
   i. is a tissue external to vascular cambium.
   ii. reduces water loss.
   iii. is a tissue which is completely living.
   iv. protects the tree from infection.

2. Describe briefly the following (only in the space provided):

(12½ x 08 = 100 marks)

a) Tylose

.....

.....

.....

.....

.....

.....

b) Stele

.....

.....

.....

.....

.....

.....

c) Velamen

.....
.....
.....
.....
.....
.....

d) Idioblast

.....
.....
.....
.....
.....
.....

e) Kranz anatomy

.....
.....
.....
.....
.....
.....

f) Piliferous layer

.....
.....
.....
.....
.....
.....

Index No.: .....

g) Aerenchyma

.....

.....

.....

.....

.....

.....

h) Runkel Ratio

.....

.....

.....

.....

.....

.....

3. Answer **ALL** questions.

a) State **Four (04)** main types of leaves found in plants.

i. .....

ii. .....

iii. .....

iv. Foliage leaves (photosynthetic leaves)

(12 marks)

b) Leaves typically possess **two (02)** surfaces and they are:

i. .....

ii. .....

(08 marks)

c) Based on the anatomy, leaves can be classified into **two (02)** major categories, namely:

i. Bifacial or .....

ii. Unifacial or .....

(08 marks)

d) Typical leaves of dicots are ..... and typical leaves of monocots are ..... .

(08 marks)

e) Onion (*Allium cepa*; Family Amaryllidaceae) is a monocot plant that possesses a centric/circular leaf.

i. Name **one (01)** anatomical feature in onion leaf which is also a characteristic in typical dicot leaf.

.....

.....

ii. Name **one (01)** anatomical feature shared by both onion leaf and a typical monocot leaf.

.....

.....

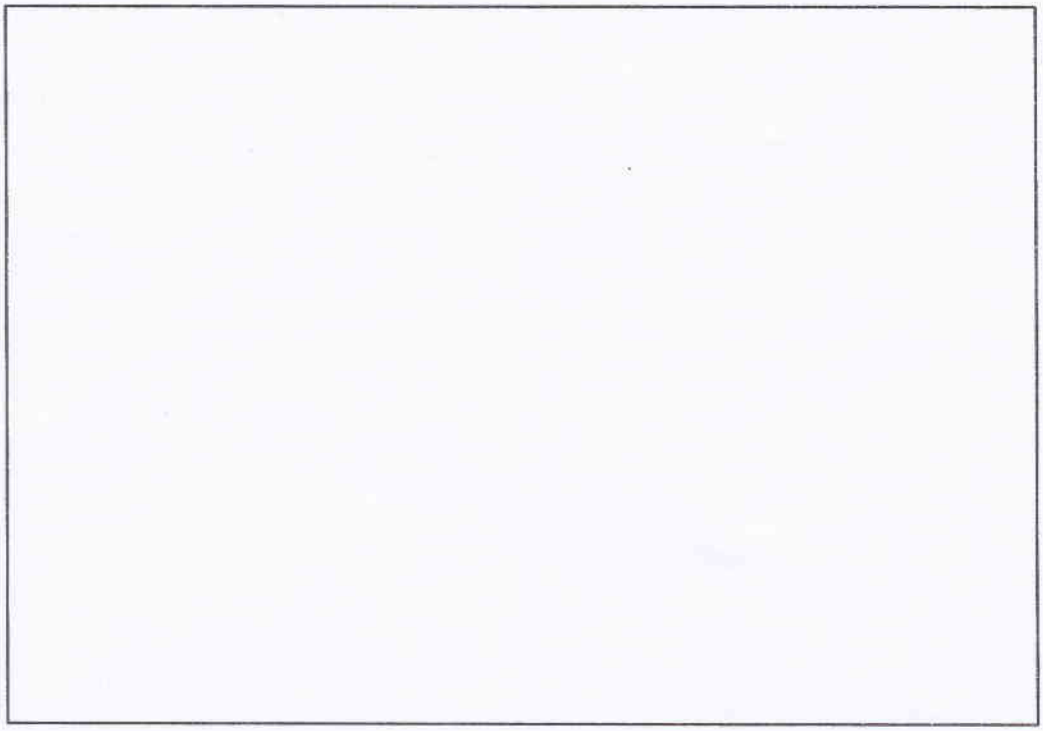
(16 marks)

f) Illustrate the anatomy of a typical dicot leaf including the midrib.

(24 marks)

Index No.: .....

g) Illustrate the anatomy of a typical monocot leaf including the midrib.



(24 marks)

Optional Questions: [Approximate time allocation is **half (½) an hour**]

Answer ONE (01) question.

---

4. There is diversity in structure and functions of trichomes in plants.
   a) Explain briefly with suitable drawings, how trichomes are grouped and described using different criteria. **(55 marks)**
   b) List **eight (08)** different functions of trichomes found in plants. **(40 marks)**
   c) What is meant by an indumentum? **(05 marks)**

5. Describe briefly how characters of wood parenchyma are used in timber identification. **(100 marks)**

--- END ---