



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

**B.Sc. (General) Degree in Applied Sciences
First Year – Semester II Examination – April /May 2015**

BIO 1205 – PLANT DIVERSITY II

Time: Two (02) hours

**Answer four (04) questions including the question no. 1.
Illustrate your answers with labeled diagrams where appropriate.**

1. For parts (a) – (I), underline only the most suitable answer. Marks will be deducted for multiple responses.

- a) After examining the mature sporophytes of three common Bryoflora, namely A, B and C; a student found that the species A contains true elaters, species B contains pseudo elaters and species C does not contain elaters. Species A, B and C respectively may be
- Anthoceros, Sphagnum and Bazzania.*
 - Bazzania, Anthoceros and Sphagnum.*
 - Sphagnum, Anthoceros and Bazzania.*
 - Sphagnum, Bazzania and Anthoceros.*
- b) Presence of multicellular rhizoids with oblique septa is a characteristic feature of
- Anthoceros and Dendroceros.*
 - Bazzania and Frullania.*
 - Leucobryum and Pogonatum.*
 - Marachantia and Riccia.*
- c) Statement X: Gemmae are found only in the members of the Division Marchantiophyta.
Statement Y: *Sphagnum zeylanicum* is a common epiphytic moss found in the highlands of Sri Lanka.
- Statement X is true, but statement Y is false.
 - Statement Y is false, but statement Y is true.
 - Both statements (X and Y) are true.
 - Both statements (X and Y) are false.

- d) Elaters of *Marchantia*, seta of *Fissidens*, and hydrome of *Pogonatum* are
- diploid, haploid and diploid respectively.
 - haploid, diploid and haploid respectively.
 - haploid, haploid and diploid respectively.
 - diploid, diploid and haploid respectively.
- e) Cancellina is a characteristic feature of the leaf of
- Calymperes*.
 - Fissidens*.
 - Octoblepharum*.
 - Pogonatum*.
- f) Presence of hyaline cells is not a key characteristic feature of the leaves of
- Calymperes*.
 - Fissidens*.
 - Leucobryum*.
 - Sphagnum*.
- g) Examples for simple thalloid, complex thalloid and leafy liverworts are respectively
- Bazzania*, *Marchantia* and *Pallavicinia*.
 - Marchantia*, *Pallavicinia* and *Bazzania*.
 - Pallavicinia*, *Bazzania* and *Marchantia*.
 - Pallavicinia*, *Marchantia* and *Bazzania*.
- h) The tapetum layers in the sporophyte of *Pogonatum*
- facilitate spores to escape through peristome.
 - provide nutrition to the developing spores.
 - facilitate the formation of protonema.
 - provide nutrition to the germinating spores.

- i) Select the suitable answer to fill in the blank.

In mosses, the is an enlarged archegonial venter that protects the capsule containing the embryonic sporophyte. It is usually lost before the spores are released from the capsule.

- i. apophysis
- ii. calyptra
- iii. operculum
- iv. seta

- j) In leafy liverworts two leaf arrangements could be witnessed, some species **having the leaves arranged so that the upper margin of each leaf lies above the lower margin of the next leaf along** and others **having the leaves arranged so that the upper margin of each leaf is covered by the lower margin of the next leaf along**. Technically those two leaf arrangements are referred to as

- i. distichous and equitant, respectively.
- ii. equitant and distichous, respectively.
- iii. incubous and succubous, respectively.
- iv. succubous and incubous, respectively.

Library
Faculty of Applied Science
Rajarata University of Sri Lanka
Mihintale.

- k) Choose the false statement regarding the Bryoflora.

- i. Bryoflora is an isolated group, not clearly related to other groups of plants, and hence an artificial assemblage of plants.
- ii. Sporophyte is the dominant generation of life cycle of Bryoflora; it is structurally different from gametophyte and physiologically depend upon the gametophyte.
- iii. Bryoflora have not served as ancestors to any other plant group and no obvious relationships with even the simplest of vascular plants.
- iv. Bryoflora show similarities to the green alga in their pigmentation, having starch as the principal carbohydrate food reserve, and cellulose as the main cell wall substance.

- l) The three main regions of a typical archegonium of Bryoflora are

- i. apophysis, theca and operculum.
- ii. foot, seta and capsule.
- iii. operculum, annulus and peristome.
- iv. stalk, venter and neck.

2. *Anthoceros* is a common Bryoflora genus of the Division Anthocerotophyta.
- Describe briefly how you would recognize *Anthoceros* in its natural habitat with reference to its morphology.
 - Using only completely labeled drawing/s, illustrate the internal structure of the sporophyte of *Anthoceros*.
 - "Sporophyte of Anthocerotophyta is relatively less dependent on its gametophyte than that of the members of Marchantiophyta and Bryophyta, and also it is more successful in reproduction than the sporophytes of Marchantiophyta and Bryophyta". Justify the statement briefly.
3. a) "When plants first moved from aquatic to terrestrial habitat, they faced many challenges. Yet they were able to survive and evolve." Explain this statement with respect to the rewards in the environment which might have supported this process.
- "Plantae evolved from Charophyta." Justify this statement.
 - State why plants are called Embryophytes. List the advantages of producing seeds to the plant.
4. a) Compare the structure of sporophyte of *Psilotum* sp. with that of *Cooksonia* sp.
- Giving one example per type, illustrate the structure of sporangia in Pterophyta bearing an apical stomium and a transverse stomium.
 - Name five heterosporous members in seedless vascular plants.
 - Differentiate the fertile region of *Schizaea* sp. from that of *Osmunda* sp.
5. a) "Gymnosperms are considered as the ancestors of angiosperms". Support this statement **only by considering the megasporophyll of the genus *Cycas***.
- State five economic and /ecological importance of gymnosperms.
 - Differentiate the ovule of *Gnetum* sp. from that of *Pinus* sp.
