



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

**B.Sc. (General) Degree in Applied Sciences
First Year - Semester II Examination –February/March 2019**

BIO 1205 – PLANT DIVERSITY II

Time: Two (02) hours

Answer THREE (03) questions including the compulsory question.

Compulsory question: [Approximate time allocation is one (01) hour].

1. Answer ALL questions. Underline the most suitable option using a pen. No marks will be given for multiple responses. (200 marks)

- a) Members of Cycadophyta
 - i. are microscopic.
 - ii. are considered as the link between gymnosperms and angiosperms.
 - iii. bear simple leaves.
 - iv. are strictly dioecious.

- b) Plants are known as embryophytes because
 - i. they produce an embryo.
 - ii. the embryo is surrounded by the endosperm.
 - iii. the developing embryo retains in the gametophyte.
 - iv. gametes are produced within gametangia.

- c) The six kingdom classification of living organisms was put forward by
 - i. Robert Whittaker.
 - ii. Ernst Haeckel.
 - iii. Carolus Linnaeus.
 - iv. Carl Woes.

- d) A student examining a sample of bryophytes observed three organisms with following features: the first one is a dichotomous thallus with prominent air pores, and the second is an irregular thallus bearing horn like structures and the third is plant like, having two rows of lateral leaves on the dorsal side. These three organisms could be respectively
 - i. *Riccia*, *Anthoceros* and *Pogonatum*
 - ii. *Marchantia*, *Anthoceros* and *Pogonatum*
 - iii. *Marchantia*, *Anthoceros* and *Frullania*
 - iv. *Marchantia*, *Dumortiera* and *Frullania*

- e) Which of the following statements are correct?
- A. *Riccia* has a heart shaped thallus.
 - B. Peristomal teeth are present in *Pogonatum*.
 - C. *Pallavicinia*. gametophyte is "plant like".
 - D. Hornworts belong to Division Anthoceroophyta
 - i. A, B, C and D
 - ii. A, C and D
 - iii. A, B and D
 - iv. B, C and D
- f) *Salvinia* sp. is a
- i. bryophyte.
 - ii. homosporous pteridophyte.
 - iii. obligate parasite.
 - iv. pteridophyte producing sporocarps.
- g) Which of the following statements are correct regarding *Gnetum* sp.
- A. Leaves are broad and with reticulate venation.
 - B. Perianth is present.
 - C. Xylem has vessels
 - D. Deciduous
 - E. Archegonia are present
 - i. A, C and D
 - ii. A, B and C
 - iii. A, B, C and E
 - iv. All of the above
- h) Select the correct statement.
- i. *Asplenium* bear a naked sorus.
 - ii. *Osmunda* has a fertile spike.
 - iii. Stomium and annulus in *Anemia* is apical.
 - iv. *Isoetes* is homosporous.
- j) A coralloid root is a symbiotic association between a cyanobacterium and
- i. *Anthoceros*
 - ii. *Azolla*
 - iii. *Pinus*
 - iv. *Cycas*
- k) Which of the following bear synangia?
- A. *Angiopteris*
 - B. *Blechnum*
 - C. *Psilotum*
 - D. *Marattia*
 - i. A and C
 - ii. C and D
 - iii. A and D
 - iv. B and C

- l) Select the correct statements.
- A. Leaves are reduced in *Psilotum*
 - B. *Ophioglossum* bear a fertile spike.
 - C. Indusium is absent in *Nephrolepis*
 - D. Ginkgophyta has fan like leaves.
 - E. *Marselia* is an aquatic fern.
- i. A, B, C and D
 - ii. B, C, D and E
 - iii. A, B, D and E
 - iv. All of the above
- m) Which of the following has/have taken place during plant evolution?
- A. Transition from land to water.
 - B. Development of a jacket layer surrounding gametangia.
 - C. Transition from homosporous to heterosporous.
 - D. Origin of the seed.
 - E. The emergence of flowering plants.
- i. A, C, D and E
 - ii. B, C, D and E
 - iii. A, B, C and D
 - iv. All of the above
- n) Which of the following pairs are correct?
- A. Pterophyta – presence of true vascular tissue
 - B. *Cycas* – megasporophylls arranged in a strobilus
 - C. *Azolla* – homosporous
 - D. *Lunularia* – Lycopphyta
 - E. *Gnetum* - a dicotyledonous embryo
- i. A, C, D and E
 - ii. A, C and D
 - iii. A and E
 - iv. A, B, C and D
- o) Select the correct statement.
- i. Sporophyte of *Ephedra* is a tall, evergreen tree.
 - ii. Sporocarps are present in *Ceratopteris*
 - iii. Plectostele is advanced when compared with siphonostele.
 - iv. *Equisetum* has hydrophytic characters.
- p) Which of the following combination is correct?
- i. *Zamia* – two ovules per mega sporophyll
 - ii. *Pinus* – broad leaves
 - iii. *Podocarpus* – female cone with compact sporophylls
 - iv. *Cycas* – simple leaves

- q) Which of the following **does not** represent a gametophyte?
- Pogonatum* "plant".
 - Selaginella* plant.
 - Nephrolepis* prothallus.
 - Dumortiera* thallus.
- r) Select the character common to both *Encephalartos* and *Pinus*
- Leaf scars on the stem.
 - Albuminous cells in the phloem.
 - Compound leaves.
 - Division of integument into layers.
- s) Elaters of *Marchantia*, foot of *Anthoceros* and hydrome of *Pogonatum* are respectively
- diploid, haploid and diploid.
 - haploid, diploid and haploid.
 - diploid, diploid and haploid.
 - haploid, haploid and diploid
- t) Both xerophytic and hydrophytic characters are prominent in
- Sphagnum*
 - Equisetum*
 - Lycopodium*
 - Rhodobryum*
- u) Select the **false** statement.
- Megasporophyll of *Agathis* bears only two ovules.
 - A long micropyle is present in the ovule of *Gnetum*
 - Podocarps*.is dioecious.
 - Adult sporophyte of *Welwitschia* is a densely branched tree.
- v) Which of the following is **not correct**?
- Sexual reproduction is absent in bryophytes.
 - Functional stomata are present in the sporophyte of *Anthoceros*
 - Fertile spike is present in *Anemia*
 - Coniferophyta contains oldest and largest trees on earth.
- w) Which of the following helped the first land plants to get established in the terrestrial habitat?
- | | |
|------------------------------------|---------------------------------------------|
| A. Less competition for resources. | B. Presence of herbivores in large numbers. |
| C. Plenty of available oxygen. | D. Harsh terrestrial conditions. |
| E. Well adapted plant body. | |
- A and C
 - A, C and E
 - B, D and E
 - All above

- x) Which of the following are consumed by man?
- A. Young leaves of *Cycas*
 - B. Young leaves of some ferns
 - C. Seeds of *Cycas*
 - D. Seeds of *Gnetum*
- i. A, C and D
 - ii. B, C, and D
 - iii A, B, and C
 - iv. All of the above
- y) Select the correct statements.
- A. Operculum is present in the sporophyte of *Marchantia*
 - B. *Bazzania* is a leafy liverwort.
 - C. Hyaline cells are present in *Sphagnum*
 - D. Gametophyte of *Riccia* sp. has a median furrow.
 - E. *Fissidens* is a true moss.
- i. A, C, D and E
 - ii. A, B, C and D
 - iii B, C, D and E
 - iv. All of the above
- z) Examples for a simple thalloid, complex thalloid and leafy liverworts are respectively
- i. *Frullania*, *Marchantia* sp. and *Pallavicinia*
 - ii *Pallavicinia*, *Riccia* and *Frullania*
 - iii *Pallavicinia*, *Marchantia* and *Frullania*
 - iv *Marchantia*, *Riccia* and *Frullania*

Optional questions: [Approximate time allocation is **half ($\frac{1}{2}$) an hour each**. Answer only **TWO (02)** questions].

2. Giving examples, illustrate the structural diversity found in the fertile region of Order Filicales. (100 marks)
3. Differentiate between the following pairs.
 - a) Strobilus of *Equisetum* sp. and the male strobilus of *Ginkgo* sp. (60 marks)
 - b) Ovule of *Cycas* sp. and that of *Pinus* sp. (40 marks)
4. a) List out any **five (05)** challenges that plants had to face with when they moved from aquatic to terrestrial habitat. (40 marks)
- b) Giving examples and illustrations, describe how bryophytes are adapted to overcome the challenges you mentioned in 4(a). (60 marks)

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