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

**B.Sc. in Applied Sciences  
First Year- Semester I Examination –March 2021**

**BOT 1201 – PLANT DIVERSITY**

**Time: Two (02) hours**

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**Answer ALL questions in section A and TWO (02) questions from section B.**

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**SECTION A**

**1. Answer ALL questions. Underline the most suitable option using a pen. No marks will be given for multiple responses. [Approximate time allocation is ONE (01) hour]**  
**(200 marks)**

- a) Members of Marchantiophyta
  - i. are always thalloid.
  - ii. maybe considered as the link between the ancestral aquatic and terrestrial plants.
  - iii. always produce gemmae.
  - iv. are strictly aquatic.
  
- b) Plants are known as embryophytes because
  - i. they produce an embryo.
  - ii. the sporophyte obtains nutrients from the gametophyte.
  - iii. sporophyte is the dominant plant.
  - iv. the developing embryo retains in the gametophyte.
  
- c) Which of the following has not taken place during plant evolution?
  - i. Transition from seed to spores
  - ii. Development of a jacket in gametangia to protect gametes
  - iii. Emergence of flowering plants
  - iv. Diversification of angiosperms
  
- d) A student examining a freshwater sample observed three organisms with the following features: the first one is a unicell, with a cup shaped chloroplast and the second is an unbranched filament having two stellate chloroplasts per cell and the third is a spherical coenobium. Select the answer which accurately identifies the three organisms in the above given order.
  - i. *Chlamydomonas*, *Spirogyra* and *Volvox*.
  - ii. *Chlorella*, *Oedogonium* and *Volvox*
  - iii. *Chlorella*, *Zygnema* and *Volvox*
  - iv. *Chlorella*, *Zygnema* and *Scenedesmus*.

- e) Which of the following statements are correct?
- A. Sexual reproduction is absent in *Aspergillus*
  - B. Water molds are true fungi.
  - C. Basidiomycota fungi possess dikaryotic mycelia.
  - D. *Plasmodiophora brassicae* is a slime mold.
- i. A, B, C and D
  - ii. A, C and D
  - iii. A, B and D
  - iv. C and D
- f) Which of the following statements are correct?
- A. Some Zygomycota fungi cause disease in human.
  - B. *Mucor* and *Rhizopus* are known as bread molds.
  - C. Potato plantations were destroyed in 19<sup>th</sup> century by pathogenic *Pythium*.
  - D. Fungi help in keeping the environment clean
- i. A, C and D
  - ii. A, B and C
  - iii. A, B, and D
  - iv. All of above
- g) Select the correct statement.
- i. *Plagiochyla* has an incubus “leaf” arrangement.
  - ii. Sporophyte of *Anthoceros* could be photosynthetic
  - iii. All bryophytes produce gemmae.
  - iv. *Rhodobryum* is a leafy liverwort.
- h) Presence of hyaline cells in “leaves” is a characteristic feature of
- i. *Pogonatum*
  - ii. *Sphagnum*
  - iii. *Fissidens*
  - iv. *Rhodobryum*
- j) Mycorrhizae is a symbiotic association between a fungus and a
- i. cyanobacterium / algae.
  - ii. plant.
  - iii. bryophyte.
  - iv. coralloid root of *Cycas*
- k) Which of the following bear sporocarps?
- A. *Ceratopteris*
  - B. *Salvinia*
  - C. *Azolla*.
  - D. *Marattia*
- i. A, B and C
  - ii. B, C and D
  - iii. A and D
  - iv. B and C

- l) Select the correct statements.
- A. Chytridiomycotan fungi are aquatic.
  - B. Ascomycetes fungi form symbiotic association with algae.
  - C. Basidiocarps are produced by Zygomycota fungi.
  - D. Some Oomycotans are plant pathogens.
  - E. Some Basidiomycetes are poisonous.
- i. A, B, C and D
  - ii. B, D and E
  - iii. A, B, D and E
  - iv. All of above
- m) Select the correct statements.
- A. Gymnosperms have an efficient vascular system.
  - B. Secondary growth is present in some gymnosperms.
  - C. A mucilage cavity is present in microsporophylls of *Ginkgo*
  - D. Perianth is present in *Gnetum*
  - E. *Bowenia* is a giant tree.
- i. A, C, D and E
  - ii. B, C, D and E
  - iii. A, B, C and D
  - iv. All of above
- n) Which of the following pairs are correct?
- A. *Cephaleuros*– terrestrial algae.
  - B. *Padina* –calcified plant body.
  - C. *Chara*– microscopic.
  - D. *Ectocarpus* – a red algae.
  - E. *Laminaria* – a source of food.
- i. A and E
  - ii. A, C and D
  - iii. A, C, D and E
  - iv. A, B, C and D
- o) Select the correct statement.
- i. Fertile leaves are present in *Hemionitis*
  - ii. A fertile spike is present in *Osmunda*
  - iii. Haplostele is more advance when compared with Siphonostele.
  - iv. In *Nephrolepis*, sporangia are protected with a pseudo indusium.
- p) Which of the following combination is correct?
- i. *Zamia*– tall, branched tree.
  - ii. Oomycota – absence of flagella.
  - iii. “Slime-molds” – ameboid nature.
  - iv. *Podocarpus* – leaves with reticulate venation.

- q) Select the character common to both *Marchantia* and *Pogonatum*
- Presence of leptome and hydrome.
  - Presence of peristomal teeth in the sporophyte.
  - Calyptra surrounding the young sporophyte.
  - Presence of protonema.
- r) Ligule of *Selaginella*, prothallus of *Nephrolepis* and sporocarps of *Marsilea* are
- diploid, haploid and diploid.
  - haploid, diploid and haploid.
  - diploid, diploid and haploid.
  - haploid, haploid and diploid, respectively.
- s) Both xerophytic and hydrophytic characters are prominent in
- Selaginella*
  - Equisetum*
  - Isoetes*
  - Psilotum*
- t) Select the **false** statement.
- Bryophytes lack lignified mechanical tissues.
  - Gemma cups in *Lunularia* are crescent shape.
  - Foot, seta and capsule are present in the archegonium of bryophytes.
  - Elaters help in spore dispersal.
- u) Which of the following is **not correct**?
- Encephalartos* is dioecious.
  - Xylem vessels are absent in *Ginkgo*
  - Coralloid roots are present in *Cycas*
  - Megasporophyll of *Pinus* sp. bears 2-6 ovules.
- v) *Gnetum* is a gymnosperm
- that could be considered as an ancestor of pro-angiosperms.
  - possessing "inflorescence" type cones.
  - having companion cells in the phloem
  - that uses animals for seed dispersal
  - with a palm like habit.

Which of the above statements are correct?

- B, C and D
  - A, B, C and D
  - A, B and D
  - All above
- w) Which of the following algae are commonly found in Sri Lanka?
- |                      |                  |                    |
|----------------------|------------------|--------------------|
| A. <i>Sargassum</i>  | B. <i>Padina</i> | C. <i>Caulerpa</i> |
| F. <i>Gracilaria</i> | E. <i>Ulva</i>   |                    |
- A, B, D and E
  - B, C, D and E
  - A, B, and E
  - All of above

- x) Select the correct statements.
- A. In *Calymperes*, gemmae are attached to the “leaf”
  - B. *Plagiochasma* is a leafy liverwort.
  - C. Special pores are present in the “leaf” of *Sphagnum*.
  - D. Gametophyte of *Riccia* has a median furrow.
  - E. Vaginant lamina is present in *Fissidens*
- i. A, B, C and E
  - ii. A, C, D and E
  - iii. B, C, D and E
  - iv. All of above
- y) Examples for bearing synangia, fertile spike and scale leaves are respectively
- i. *Drynaria*, *Marattia* and *Equisetum*
  - ii. *Psilotum*, *Anemia* and *Schizaea*
  - iii. *Marattia*, *Schizaea*, and *Equisetum*
  - iv. *Psilotum*, *Helminthostachys* and *Equisetum*
- z) The resemblance between fungi and oomycetes is due to
- i. parallel evolution.
  - ii. convergent evolution.
  - iii. congruent evolution.
  - iv. divergent evolution.

### SECTION B

[Answer any **TWO (02)** questions. Approximate time allocation is **HALF (½) an hour per question**].

2. Describe the reproductive diversity found in the sporophytic generation in order Filicales. (100 marks)
3. a) Differentiate the ovule of *Cycas* from that of *Gnetum* (70 marks)  
 b) “Deuteromycota fungi have both positive and negative impacts on food”  
 Justify the above statement. (30 marks)
4. a) Compare the thallus of *Halimeda* with that of *Padina*. (30 marks)  
 b) Describe briefly how *Pogonatum* is adapted to face challenges in the terrestrial environment. (70 marks)