

**BOT1502**

May/June 2016

**PLANT BIODIVERSITY AND ENVIRONMENTAL BOTANY**

Duration 2 Hours

100 Marks

**EXAMINERS .**

FIRST

MS LT MANKGA

SECOND

MR AR MUDAU

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**Closed book examination**

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**This paper consists of SEVEN (7) pages.**

**ANSWER ALL THE QUESTIONS IN THE EXAMINATION ANSWER BOOK PROVIDED.**

**[TURN OVER]**

**QUESTION 1**

Choose the correct answer for each of the following questions. Write only the number of the question with the correct option (i.e. letter a, b, c, d, or e) next to it. Each answer must be on a separate line in your answer book. Example 1.1 a

- 1.1 Plate tectonics ultimately helps to explain \_\_\_\_\_
- A the creation of mountains and volcanoes
  - B continental drift
  - C changes in the ocean floor
  - D Both A and B are correct
  - E A, B and C are correct
- 1.2 In \_\_\_\_\_, the selecting agent is the environment, whereas in \_\_\_\_\_, the selecting agent is humans
- A natural selection, convergent evolution
  - B mutation, artificial selection
  - C homoplasy, homology
  - D artificial selection; natural selection
  - E natural selection, artificial selection
- 1.3 Co-evolution is illustrated by \_\_\_\_\_
- A grasses and grazing animals
  - B flowering plants and insect pollinators
  - C flowering plants and herbivores
  - D Both B and C are correct
  - E All of the above are correct

**[TURN OVER]**

- 1 4 Jointed, hollow stems with whorled microphylls are characteristic of \_\_\_\_\_
- A quillworts
  - B horsetails
  - C ferns
  - D all seedless vascular plants
  - E club mosses
- 1 5 Which of the following statements are TRUE about *Psilotum*?
- A It lacks true roots and true leaves
  - B The sporophytes live as independent plants
  - C The gametophytes are small, inconspicuous and non-photosynthetic
  - D Sporophytes produce tri-lobed sporangia, within which spores are produced by meiosis
  - E All of the above are true
- 1 6 The rachis of a fern is \_\_\_\_\_
- A an uncoiled, immature frond
  - B a covering over a sorus
  - C an extension of the petiole of the leaf
  - D a type of sporophyll
  - E a cone-shaped structure that contains spores
- 1 7 In the scientific name *Capsicum annum*, *Capsicum* is the \_\_\_\_\_ and *annum* the \_\_\_\_\_
- A class, order.
  - B genus, species epithet.
  - C kingdom, phylum
  - D family, genus
  - E None of the above

[TURN OVER]

- 1 8 The use of prokaryotes to clean up ecologically contaminated areas, such as sites of oil spills, is known as \_\_\_\_\_
- A rehabilitation
  - B bioremediation.
  - C recycling
  - D extraction
  - E None of the above
- 1.9 Dioecious plants produce
- A carpellate and staminate flowers on separate plants.
  - B carpellate and staminate flowers on the same plant
  - C bisexual flowers
  - D both bisexual and unisexual flowers on the same plant
  - E no flowers
- 1 10 Seedless vascular plants have \_\_\_\_\_ to conduct water and dissolved minerals, and \_\_\_\_\_ to conduct dissolved sugar
- A a cuticle, xylem
  - B phloem; stoma
  - C phloem, xylem
  - D stoma, a cuticle
  - E xylem, phloem

[TURN OVER]

- 1 11 The pistil has three sections
- A a stigma, style and anther
  - B an anther, filament and ovule
  - C a stigma, style and ovary
  - D an ovary, ovule and sepal
  - E a corolla, stamen and sepal
- 1 12 Enations are
- A a type of sporangium
  - B specialised buds produced along the stems of horsetails
  - C the sporangia-bearing branches of rhinophytes
  - D immature fern leaves
  - E tiny leaf-like structures on the stems of *Psilotum*
- 1 13 Groups of sporangia on fertile leaves are called
- A pinnae
  - B fronds
  - C fiddleheads
  - D indusial
  - E sori
- 1 14 The world's tallest plants are members of which group?
- A Ginkophyta
  - B Gnetophyta
  - C Cycadophyta
  - D Coniferophyta
  - E Ginkophyta and Gnetophyta

[TURN OVER]

- 1 15 Plants are a source of \_\_\_\_\_
- A oxygen
  - B fossil fuels
  - C spices
  - D alkaloids
  - E All of the above are correct
- 1 16 Cellulose \_\_\_\_\_
- A is a major component of the cell walls of plants
  - B is a type of alkaloid
  - C is a raw material that is used in photosynthesis
  - D is composed of a chain of glucose molecules
  - E A and D are correct
- 1 17 The ground tissue of the fundamental tissue system includes \_\_\_\_\_
- A parenchyma
  - B collenchyma
  - C fibres
  - D A and B are correct
  - E All of the above are correct
- 1 18 Which of the following statement(s) is/are true about the human use of plants?
- A Most of our food ultimately comes from just a few kinds of plants
  - B Some alkaloids have important uses as medicines
  - C Wood consists of the dead cells of certain plants
  - D Plants are the source of spices and many alcoholic drinks
  - E All of the above are correct.

(18 x 2) =[36]  
[TURN OVER]

**QUESTION 2**

- 2.1 What is pollination? What are the main forms of pollination? (10)
- 2.2 Why are pteridophytes better adapted to dry land than bryophytes? Were pteridophytes always less abundant than phanerogamic plants? (4)
- [14]**

**QUESTION 3**

- 3.1 How does biological diversity relate to the characteristics of the abiotic factors of an ecosystem? (10)
- 3.2 How do the availability of water and light and the climate affect the growth of a population? (10)
- 3.3 How do populations of predators and prey vary in predatism? (10)
- [30]**

**QUESTION 4**

Use a table to compare the life cycles of the three phyla of bryophytes that you have studied. Use the following headings

- Structure of the gametophyte
- Pattern of growth of the gametophyte
- Structure of the sporophyte
- Structure that disperses spores
- Position of the archegonium and antheridium

**[20]**

**TOTAL MARKS: 100**