

BOT1502

October/November 2016

PLANT BIODIVERSITY AND ENVIRONMENTAL BOTANY

Duration 2 Hours

100 Marks

EXAMINERS

FIRST

MS LT MANKGA

SECOND

MR AR MUDAU

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

- 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
- 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

[TURN OVER]

- 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
- 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

[TURN OVER]

- 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
- 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*

[TURN OVER]

- 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
- 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

[TURN OVER]

- 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]

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]

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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**