

**BOT1501**

May/June 2016

**PLANT STRUCTURE: CYTOLOGY, MORPHOLOGY AND ANATOMY**

Duration 2 Hours

100 Marks

**EXAMINERS**

FIRST

MR AR MUDAU

SECOND

MS LT MANKGA

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**Closed book examination**

**This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue**

**This paper consists of FIVE (5) pages.**

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

**[TURN OVER]**

## QUESTION 1

Choose the best answer for each of the following questions Write only the number with the correct answer next to it, for example 1.1 a. Each answer must be on a separate line in your answer book.

- 1 1 Which statement is false about plants?
- a They are generally characterised by indeterminate growth
  - b They reproduce sexually and asexually
  - c A major component of their cell walls is cellulose
  - d They are heterotrophs
  - e They produce multicellular embryos
- 1 2 The largest volume in a mature plant cell is occupied by \_\_\_\_\_
- a the nucleus
  - b chloroplasts
  - c the cell wall
  - d a central vacuole
  - e mitochondria
- 1 3 Both animal cells and plant cells contain \_\_\_\_\_
- a mitochondria
  - b a cell wall
  - c chloroplasts
  - d a large central vacuole
  - e All of the above are correct
- 1 4 Cristae \_\_\_\_\_
- a increase the surface area of the inner surface of mitochondria
  - b are enfoldings of the inner membrane of ribosomes
  - c store starch
  - d are the sites of photosynthesis within chloroplasts
  - e are a type of microbody
- 1 5 Plant biotechnology and the development of genetically modified (GM) plants can provide \_\_\_\_\_
- a more nutritious food
  - b herbicide-resistant plants
  - c new sources of vaccine
  - d pest-resistant plants
  - e All of the above

[TURN OVER]

- 1 6 Lateral meristems \_\_\_\_\_
- a produce secondary growth in woody plants
  - b make stems thicker
  - c make roots thicker
  - d Both b and c are correct
  - e a, b, and c are correct
- 1 7 A cladogram \_\_\_\_
- a is typically produced from a character table
  - b is a kind of phylogenetic tree
  - c depicts possible evolutionary relationships among organisms
  - d is constructed using outgroups and ingroups
  - e has all of the above features
- 1 8 The shortening Stromatolites are \_\_\_\_\_
- a fossils produced by numerous layers of prokaryotes
  - b primitive eukaryotic organisms
  - c the main constituents of 'organic soups'
  - d evidence that photosynthesis first evolved in simple eukaryotes
  - e None of the above.
- 1 9 Which cell types are part of the xylem tissue?
- a Tracheids and vessel elements
  - b Sieve cells and albuminous cells
  - c Collenchyma and sclereids
  - d Sieve-tube members and companion cells
  - e Both b and c are correct
- 1 10 The ground tissue of fundamental tissue system includes \_\_\_\_\_
- a parenchyma
  - b collenchyma
  - c fibres
  - d Both a and b are correct
  - e All of the above are correct

[10×2= 20]

[TURN OVER]

**QUESTION 2**

Match each group in column A to one relevant reproduction in column B Write down the number and the letter only, for example 6. f **Do not rewrite the whole sentence.**

Column A	Column B
1 Bryophytes	a Single-celled spores, eggs and flagellate sperm
2 Lycophytes	b Seeds in cones, eggs and sperm (the sperm of some groups, but not all of them, have flagella)
3 Angiosperms	c Single-celled spores, eggs and flagellate sperm
4 Gymnosperms	d Single-celled spores, eggs and flagellate sperm
5 Pteridophytes	e Flowers, seeds in fruits, eggs and non-flagellate sperm

[5]

**QUESTION 3**

Distinguish or explain the difference between the following

- 3 1 Asexual and sexual reproduction (4)
- 3 2 Autotrophic and heterotrophic organisms (4)
- 3 3 Angiosperms and gymnosperms (4)
- 3 4 Light and electron microscope (4)

[16]

**QUESTION 4**

- 4 1 Describe the manner in which plants contribute toward animals as well as humans (4)
- 4 2 Do you think plants can survive without animals? If your answer is yes or no, why? (4)
- 4 3 What are the three effects that psychoactive plant compounds have on humans? (3)

[11]

[TURN OVER]

**QUESTION 5**

- 5 1 Describe the differences between eukaryotic cells and prokaryotic cells (10)
- 5 2 Name at least five different types of modified stems and give the function of each (10)
- 5 3 Name the different types of meristems and their derivatives in plants (10)
- [30]**

**QUESTION 6**

- 6 1 How can fossils help a biological scientist? (4)
- 6 2 Define natural selection (3)
- 6 2 How did Darwin's theory of evolution differ from that of Lamarck? (6)
- 6 2 Explain the contribution that Carolus Linnaeus made to binomial nomenclature (5)
- [18]**

**TOTAL: 100 marks**