

BOT1501

May/June 2017

PLANT STRUCTURE: CYTOLOGY, MORPHOLOGY AND ANATOMY

Duration 2 Hours

100 Marks

EXAMINERS

FIRST

MR AR MUDAU

SECOND

MS LT MANKGA

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 foldings 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 of the chromosomes and disappearance of the nuclei are distinctive features of _____
- a prophase
 - b metaphase
 - c anaphase
 - d telophase
 - e cytokinesis
- 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

[10x1 = 10]

[TURN OVER]

QUESTION 2

- 2 1 How do taproot and fibrous root systems differ? (4)
- 2 2 Describe cell development and maturation through the zones near a root tip (10)
- 2 3 What are the functions of the root tap, mucigel, and root hairs? (6)
- [20]**

QUESTION 3

Distinguish or explain the difference between the following

- 3 1 Autotrophic and heterotrophic organisms (4)
- 3 2 Heartwood and sapwood (4)
- 3 3 Phonetic approach and cladistics approach (4)
- 3 4 Bottleneck effect and genetic effect (4)
- [16]**

QUESTION 4

- 4 1 What is the advantage of apical dominance to a plant? (3)
- 4 2 Name the three basic types of tissues in plants. Where are they located and what functions do they perform? (15)
- 4 3 Name at least five different types of modified stems and give the function of each (5)
- [23]**

QUESTION 5

- 5 1 Briefly describe five different methods of seed dispersal (10)
- 5 2 Use a table to differentiate between simple and multiple fruits. Give an example for each (4)
- [14]**

[TURN OVER]

QUESTION 6

- 6 1 What is meant by a mechanism of evolution? (3)
- 6 2 One of the Darwin's principles was that there is a struggle for existence among living organisms. Do plants struggle with one another to survive? If so, how do they do it? (4)
- 6 3 List FOUR examples of limiting factors that can cause competition between plants (4)
- 6 4 Explain the contribution that Carolus Linnaeus made to binomial nomenclature (6)

[17]**TOTAL: 100 marks**