

BOT1501

October/November 2016

PLANT STRUCTURE· CYTOLOGY, MORPHOLOGY AND ANATOMY

Duration 2 Hours

100 Marks

EXAMINERS

FIRST

MR AR MUDAU

SECOND

MS LT MANKGA

Closed book examination

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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

[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 Primary and secondary growth (4)
- 3 2 Autotrophic and heterotrophic organisms (4)
- 3 3 Angiosperms and gymnosperms (4)
- 3 4 Light and electron microscope (4)
- 3 5 Prokaryotes and eukaryotes (4)

[20]

QUESTION 4

Describe the following terms

- 4 1 Classification (2)
- 4 2 Evolution (2)
- 4 3 Systematic (2)
- 4 4 Zygote (2)

[TURN OVER]

4 5 Natural selection

[10]

QUESTION 5

5 1 Briefly describe five different methods of seed dispersal (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 Describe the five factors that, according to the Hardy-Weinberg equilibrium, cause the frequency of alleles to remain constant in a population (10)

6 2 Explain the contribution that Carolus Linnaeus made to binomial nomenclature (5)

[15]

TOTAL: 100 marks