



FACULTY OF SCIENCE

DEPARTMENT OF BOTANY and PLANT BIOTECHNOLOGY

MODULE **PLANT DIVERSITY**
 BOT1B10

CAMPUS **APK**

EXAMINATION **NOVEMBER 2015**

DATE
14/November/2015

SESSION
08:30 – 11:30

EXAMINER:

PROF A. MOTEETEE

INTERNAL MODERATOR:

MRS J. WILLIAMSON

DURATION: 3 HOURS

MARKS: 120

NUMBER OF PAGES: 11 PAGES

INSTRUCTIONS: ANSWER ALL THE QUESTIONS

QUESTION 1

[10]

Choose an answer that matches the question the best: Only write down the correct answer next to the appropriate question number on your answer sheet.

- 1.1. Apart from food and beverages, plants provide human beings with:
- a) Oxygen, nitrogen, construction materials
 - b) Medicines, essential oils, oxygen, fuel
 - c) Paper, wool, cotton, silk
 - d) Herb and spices, carbon, sodium, fodder for animals

- 1.2 Gymnosperms bear their seeds on the surfaces of:
- a) Leaves
 - b) Cones
 - c) Stems
 - d) Fruits
- 1.3 Bryophytes have life cycles that depend on what for reproduction?
- a) Water
 - b) Soil
 - c) Grass
 - d) Sun
- 1.4 Plants that have xylem and phloem are known as:
- a) Seed plants
 - b) Photosynthetic plants
 - c) Vascular-plants
 - d) Non-vascular plants
- 1.5 Which on the following is the stalk by which the leaf blade is attached to the stem?
- a) Peduncle
 - b) Pedicel
 - c) Inflorescence
 - d) Petiole
- 1.6 Seed plants use _____ and _____ to reproduce.
- a) Pollen and seed
 - b) Seeds and water
 - c) Food and water
 - d) Leaves and petals
- 1.7 Wind pollination relies on _____ to get pollen from one (1) plant to another.
- a) Weather
 - b) Plants
 - c) Animals
 - d) Insects
- 1.8 In plants, a long trailing stem that produces roots when it touches the ground is a:
- a) Phyllode
 - b) Tendril

- c) Stolon
- d) Hypocotyl

1.9 Haploid or gamete-producing phase of a plant is called a:

- a) Gametophyte
- b) Pollen
- c) Embryo sac
- d) Sporophyte

1.10 Characteristics of the Plant Kingdom:

- a) Photosynthetic, no alternation of generations, unicellular
- b) Heterotrophic, alternation of generations, cellulose cell walls
- c) Photosynthetic, multicellular, alternation of generations, cellulose cell walls
- d) Photosynthetic, no alternation of generations, cellulose cell walls, unicellular

QUESTION 2

[5]

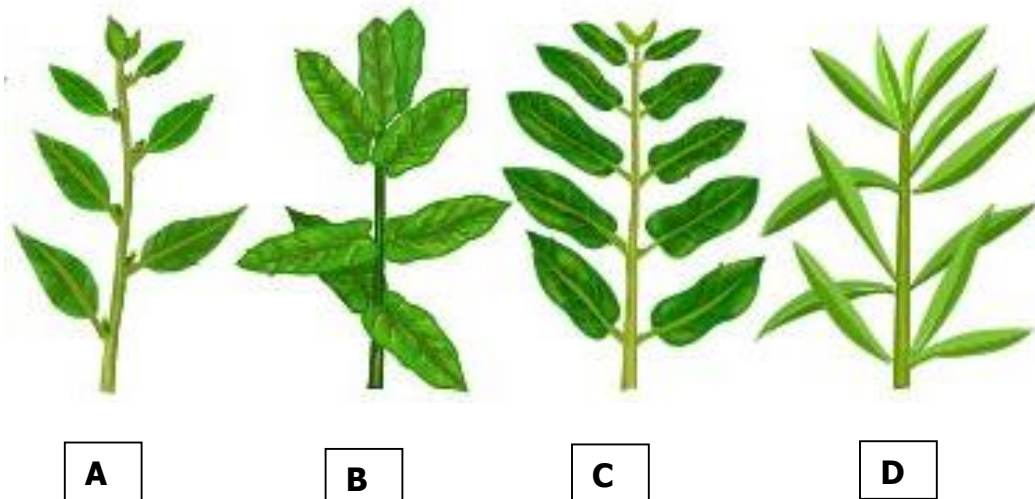
- 2.1 What is the scientific name for the South African national flower? (2)
- 2.2 Which is the universal language used by Scientists to name plants? (1)
- 2.3 What is the correct way of writing scientific names when hand-written? (1)
- 2.4 Mention one (1) advantage of using scientific names instead of common names. (1)

QUESTION 3

[10]

3.1 Identify the leaf arrangements shown in the pictures below:

(5)



3.2 What type of metamorphic leaves are shown below? Give one function of each. ($10 \times \frac{1}{2} = 5$)



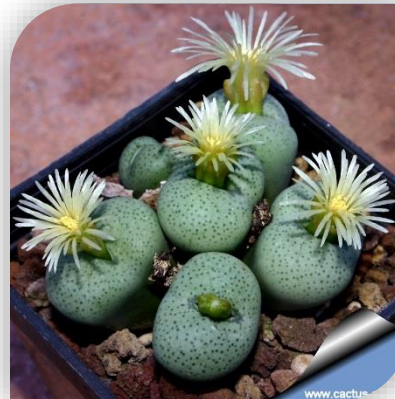
A



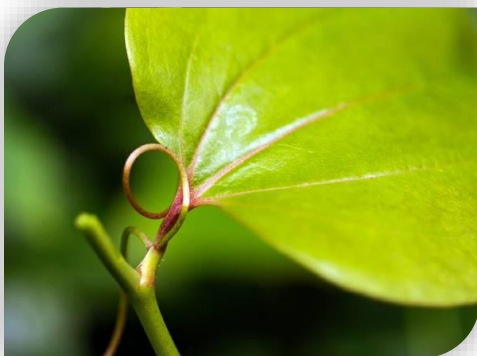
B



C



D



E

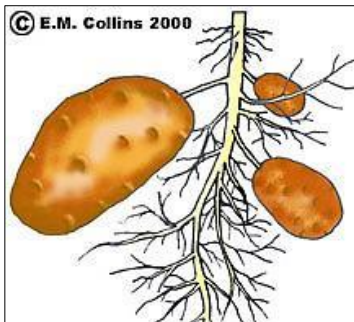
QUESTION 4

[15]

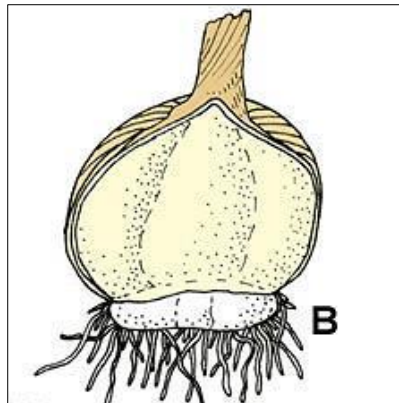
4.1 Distinguish between monopodial and sympodial branching. (2)

4.2 Provide names for the following modified stems and give one (1) function of each.

(10 x ½ = 5)



A



C



D



E

4.3 List five (5) modified roots. (5)

4.4 Mention three (3) functions of roots. (3)

QUESTION 5

[10]

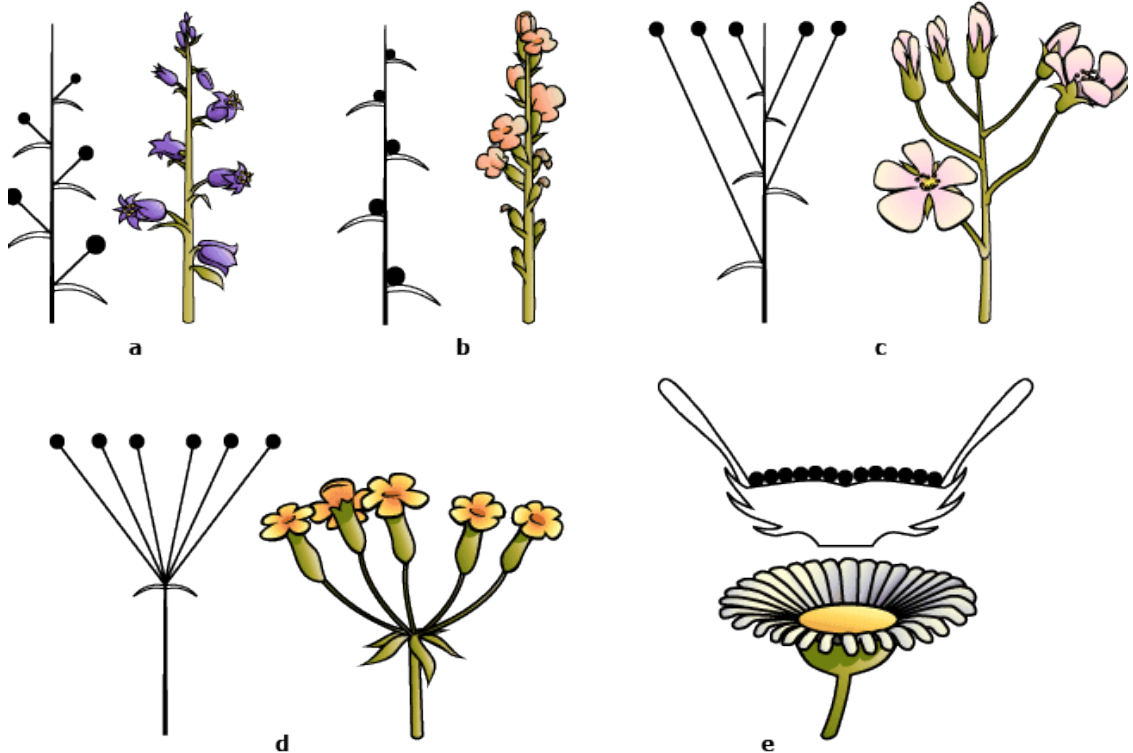
5.1 Define the following terms:

(5)

- a) Pistillate flowers
- b) Monodynamous flowers
- c) Connation
- d) Epipetalous stamens
- e) Perianth

5.2 Identify the inflorescence types (a-e) depicted in the following pictures:

(5)



QUESTION 6

[10]

6.1 Based on number of ovaries, carpels and flowers that take part in the fruit formation, fruits can be divided into three categories, what are they?

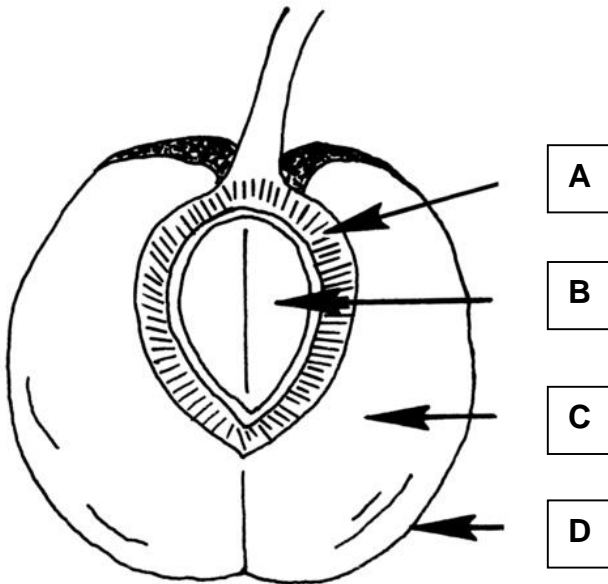
(3 x ½ = 1½)

6.2 Name five (5) different types of fleshy fruits.

(5 x ½ = 2½)

6.3 Provide labels for the fruit picture shown below:

(4 x ½ = 2)



6.4 Identify the following fruit types:

(4 x ½ = 2)



A



B



C



D

- 6.5 Distinguish between multiple and aggregate fruits. (2)

QUESTION 7

[10]

- 7.1 What are the characteristics of flowers pollinated by the following pollinating agents? (6)
- a) Birds
 - b) Bats
- 7.2 Name two (2) structural strategies adapted by some plants in order to promote cross-pollination. (2)
- 7.3 Mention one (1) advantage and one disadvantage of cross-pollination. (2)

QUESTION 8

[5]

Construct a floral formula for the flower depicted below:

(10 x ½ = 5)



QUESTION 9

[5]

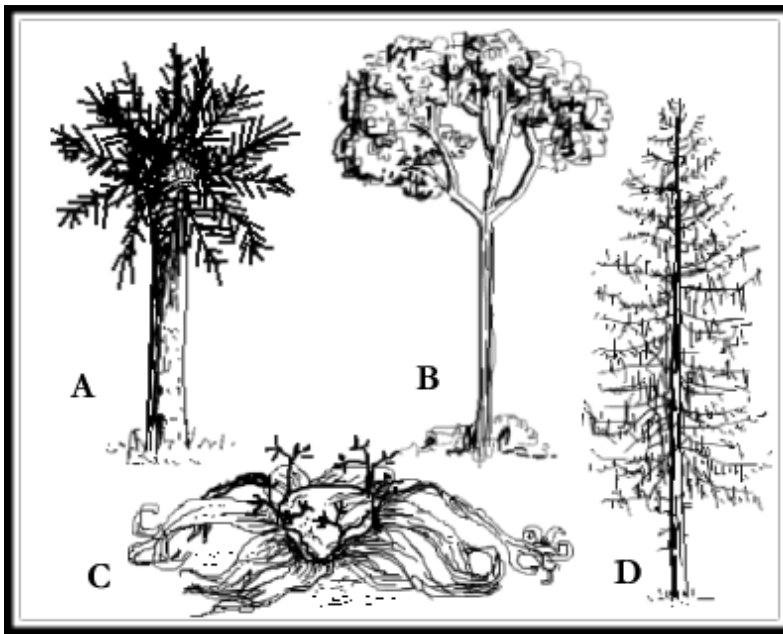
Tabulate the differences between vascular and non-vascular plants.

(5)

QUESTION 10

[15]

10.1 Study the diagrams below and answer the questions that follow:



10.1.1 To which group of plants do all the plant species above belong? (1)

10.1.2 List the five (5) most important characteristics of the plant group mentioned in 10.1.1. (5)

10.1.3 Provide the genus name of the plant labelled C. (2)

10.1.4 What makes the plant labelled C unique? (2)

10.2 Complete the following statements regarding angiosperms (write the correct word(s) only): (5)

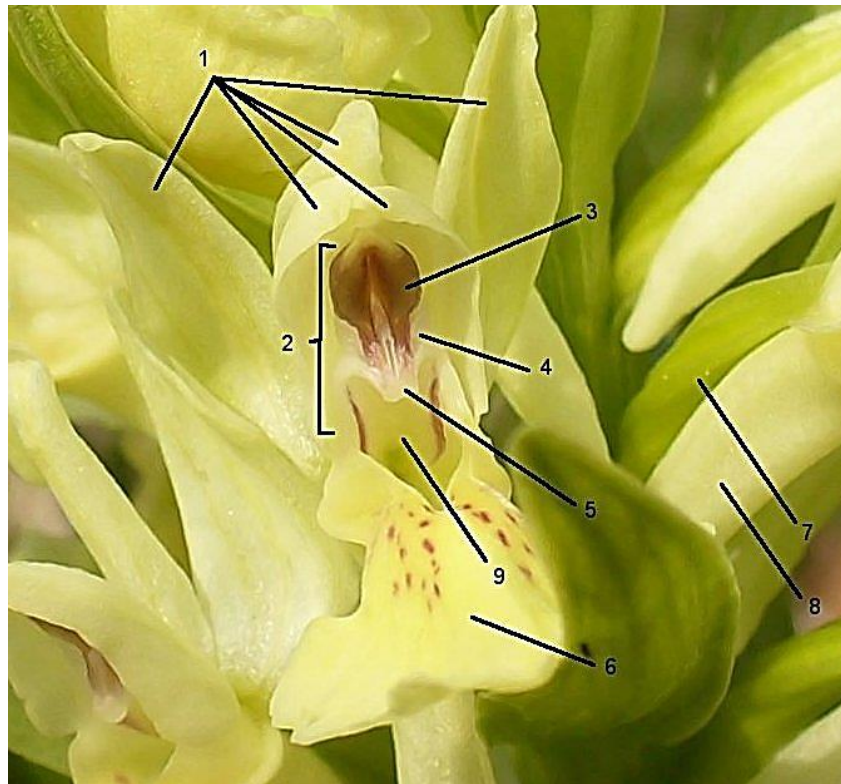
Angiosperms exhibit an alternation of _____: The diploid _____ generation alternates with the _____ gametophyte generation. The

_____ is the dominant generation and the gametophyte depends on it for
_____.

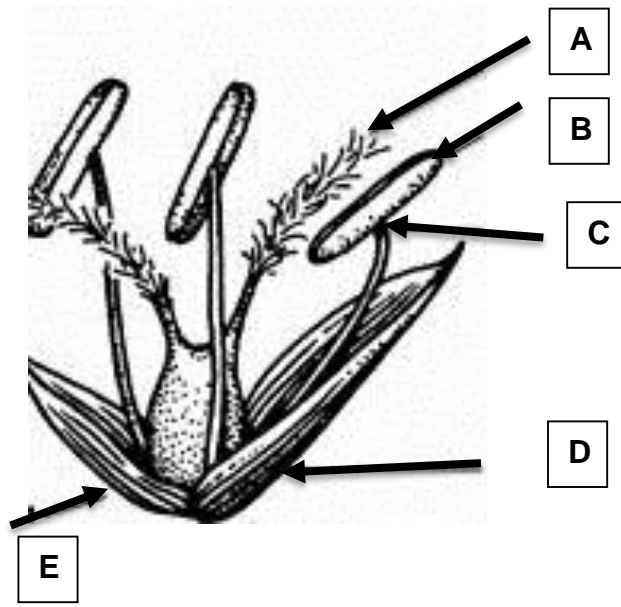
QUESTION 11

[20]

- 11.1 Which is the second largest family of flowering plants? (1)
- 11.2 What is the most important distinguishing feature between the family in 11.1 above and the rest of the flowering plants? (1)
- 11.3 Identify structures marked 1-9 below: (9 x ½ = 4½)



- 11.4 What kind of fruits are produced by the members of the family Liliaceae? (1)
- 11.5 Name two (2) ways in which some members of the Liliaceae are important to human beings. (3)
- 11.6 Label the grass floret represented by the diagram below: (5 x ½ = 2½)



- 11.7 What kind of a fruit is produced by members of the family Poaceae? (1)
- 11.8 To which family do the subfamilies Caesalpinioideae, Papilionoideae and Mimosoideae belong? (1)
- 11.9 Based on floral symmetry how can these subfamilies be distinguished from each other? (3)
- 11.10 To which family does the South African national flower belong? (1)
- 11.11 What type of inflorescence do members of this family (11.8 above) have? (1)

QUESTION 12

[5]

- 12.1 Distinguish between autotrophs and heterotrophs. (2)
- 12.2 Describe the Fynbos biome of South Africa (3)