



**PAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DEPARTMENT OF NATURAL AND APPLIED SCIENCES

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| QUALIFICATION: BACHELOR OF SCIENCE | |
| QUALIFICATION CODE: 07BOSC | LEVEL: 6 |
| COURSE CODE: PSF602S | COURSE NAME: PLANT STRUCTURE AND FUNCTION |
| SESSION: JANUARY 2023 | PAPER: THEORY |
| DURATION: 3 HOURS | MARKS: 100 |

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| SUPPLEMENTARY / SECOND OPPORTUNITY EXAMINATION QUESTION PAPER | |
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| MODERATOR: | PROF PERCY CHIMWAMUROMBE |

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| <p style="text-align: center;">INSTRUCTIONS</p> <ol style="list-style-type: none">1. Write clearly and neatly2. Number the answers clearly3. All written work MUST be done in blue or black ink4. No books, notes and other additional aids are allowed5. Mark all answers clearly with their respective question numbers6. Draw diagrams wherever necessary |
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PERMISSIBLE MATERIALS

None

THIS QUESTION PAPER CONSISTS OF 7 PAGES
(Including this front page)

QUESTION 1:

Multiple choices

[14]

Each carry one mark

- 1.1 Artichoke hearts are tender with a strong flavour. The leaves have a similar flavour but are fibrous and difficult to chew. The leaves must contain large amounts of _____.
- a) collenchyma
 - b) trichomes
 - c) phloem
 - d) sclerenchyma
- 1.2 Which of the following correctly describes a feature unique to monocot stems?
- a) vascular tissue is located all in the centre
 - b) vascular bundles are scattered throughout
 - c) vascular bundles are arranged in a ring
 - d) ground tissue consists mainly of parenchyma
- 1.3 Heartwood and sapwood consist of _____.
- a) secondary xylem
 - b) secondary phloem
 - c) periderm
 - d) bark
- 1.4 Collenchyma hypodermis is characteristics of;
- a) monocot root
 - b) monocot and dicot stem
 - c) monocot stem
 - d) dicot stem
- 1.5 This is not a characteristic feature of anatomy of dicotyledonous root;
- a) pith little or absent
 - b) secondary growth
 - c) radial vascular bundles
 - d) vascular bundles 15-20
- 1.6 An olive is an example of a;
- a) drupe
 - b) berry
 - c) pome
 - d) aggregate fruit
- 1.7 Removal of anther is called;
- a) emasculation
 - b) bagging
 - c) artificial hybridization
 - d) pollination

- 1.8 A new plant forms from a stem that broke off of the parent plant. This is an example of _____.
- asexual reproduction
 - sexual reproduction
 - tissue culture propagation
 - propagated by grafting
- 1.9 How do most flowering plants avoid self-fertilization?
- they discourage pollinators
 - the physical arrangement of stamens and carpels makes self-fertilization unlikely
 - they have self-incompatibility and reject their own pollen
 - stamens and carpels on the same plant mature at different times
- 1.10 A typical angiospermic anther is;
- bilobed
 - unilobed
 - trilobed
 - tetralobed
- 1.11 The figure 1 shows a section through a fruit containing a seed.

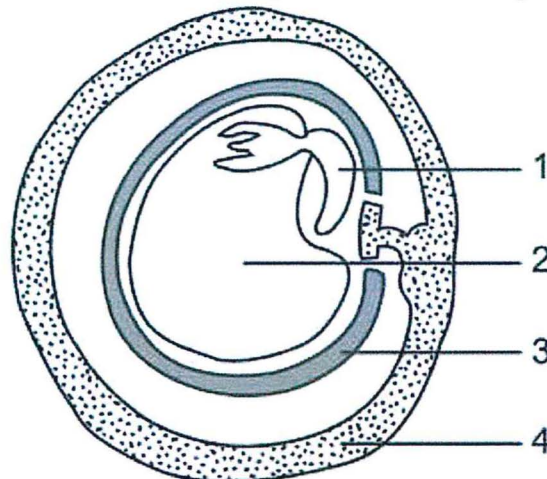


Figure - 1

What are the labelled parts in figure 1?

| | 1 | 2 | 3 | 4 |
|---|-----------|-----------|----------|----------|
| A | cotyledon | radicle | pericarp | testa |
| B | cotyledon | radicle | testa | pericarp |
| C | radicle | cotyledon | pericarp | testa |
| D | radicle | cotyledon | testa | pericarp |

- 1.12 Which group of seeds has hairy parachutes?
- water lilies and alder tree
 - dandelion and milkweed
 - coconut and goosegrass
 - poppy and orchid
- 1.13 Humans often manipulate plants in order to create results that are better fit for their needs. What process is often used to create new hybrids of grapes for making wine?
- grafting
 - bulb
 - corm
 - rhizome
- 1.14 The figure 2 below show two kinds of fruit.

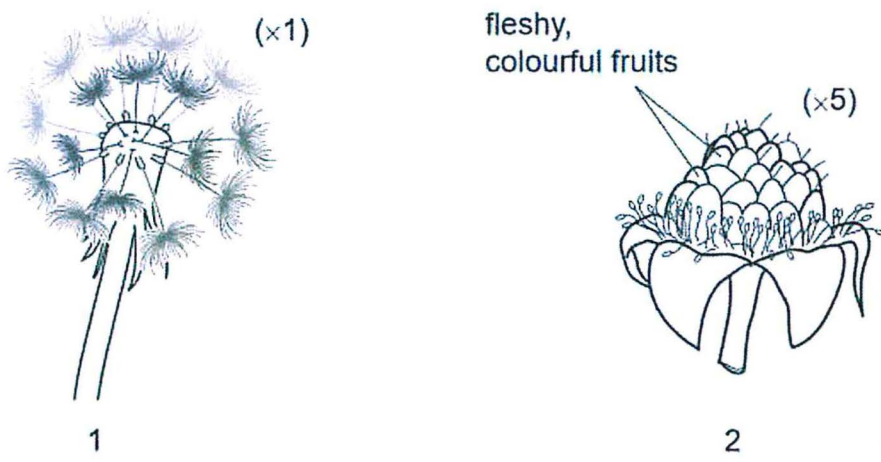


Figure 2

How are the seeds of these fruits dispersed?

| | 1 | 2 |
|----|--------|--------|
| a) | birds | mammal |
| b) | birds | wind |
| c) | mammal | birds |
| d) | wind | mammal |

QUESTION 2:

One-sentence answers

[4]

Each carry one mark

- 2.1 Name the secondary metabolite that replaces arginine in insect and changes tertiary structure; kills insect.
- 2.2 Name the antimicrobial production of those induced by hypersensitive response that attack specific pathogen and stimulate changes in the cell wall that confine the pathogen.
- 2.3 Why is apple called a false fruit?
- 2.4 A Venus' flytrap knows to shut by feeling the fly inside the flower. What type of tropism is this?

QUESTION 3:

Distinguish between the pairs of the following terms.

[6]

Each carry two marks

- 3.1 Cork cambium and vascular cambium
- 3.2 Autumn and Spring wood
- 3.3 Aggregate and simple fruits

QUESTION 4:

Short questions

[15]

- 4.1 Give one piece of evidence that shows translocation occurs in phloem tissue. (3)
- 4.2 What is pollination? Explain the different types of pollination. (4)
- 4.3 List and describe two mutualistic relationships between roots and other organisms. (4)
- 4.4 Describe the zones of primary growth in roots. (4)

QUESTION 5:

Longer questions

[20]

- 5.1 Discuss the structure of stomata, outline the physiological changes that accompany stomatal opening during the daytime. (5)
- 5.2 Explain any five terms related to the margin of leaf and include a sketch. (5)
- 5.3 In the tabular form mention the differences between the process involved in legume partnerships with nitrogen-fixing bacteria and plant partnerships with mycorrhiza fungi. (10)

QUESTION 6:

Structures and functions

[13]

- 6.1 Use the figure 3 to answer each question.

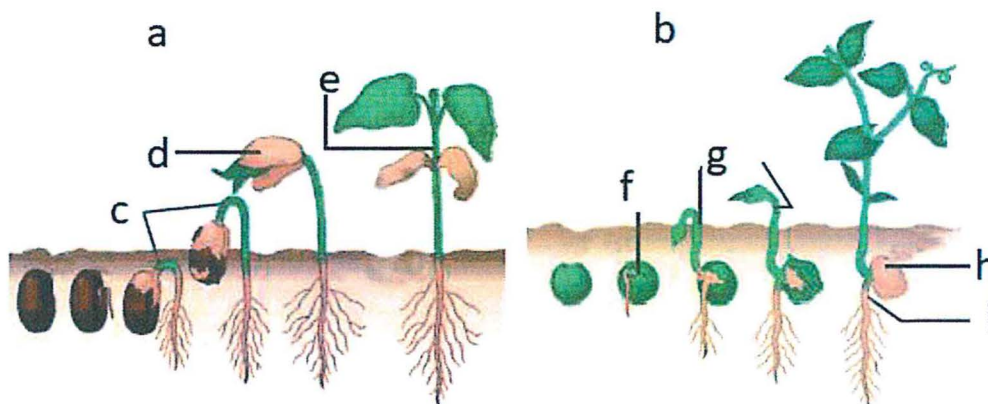


Figure 3

- 6.1.1 Identify the type of seed germination shown in the diagram a. (1)
- 6.1.2 Refer to the diagram a of figure 3 above, where the food is mainly stored. (1)
- 6.1.3 Which type of seed germination, the cotyledons remain under or just on the surface of the soil? (1)
- 6.1.4 Name the portion of the embryonic stem above the attachment point of the cotyledons in bean seed germination. (1)
- 6.1.5 Refer to the diagram above. Identify the structure labelled in c, d, g and h. (2)
- 6.1.6 Name the portion of the embryonic stem above the attachment point of the cotyledons in maize seed germination. (1)
- 6.1.7 Refer to the diagram b of figure 3 above, where the food is mainly stored. (1)

6.2 Sketch the internal structure of monocot seed and label its parts. (5)

QUESTION 7:

Essay questions [28]

7.1 Discuss the cross-section of a dicotyledonous stem and describe the functions of each tissue. (15)

7.2 Describe the structure and development of the male gametophyte in the flowering plant (male gametes). Draw and label a diagram to illustrate this. (13)

END OF EXAMINATION QUESTION PAPER