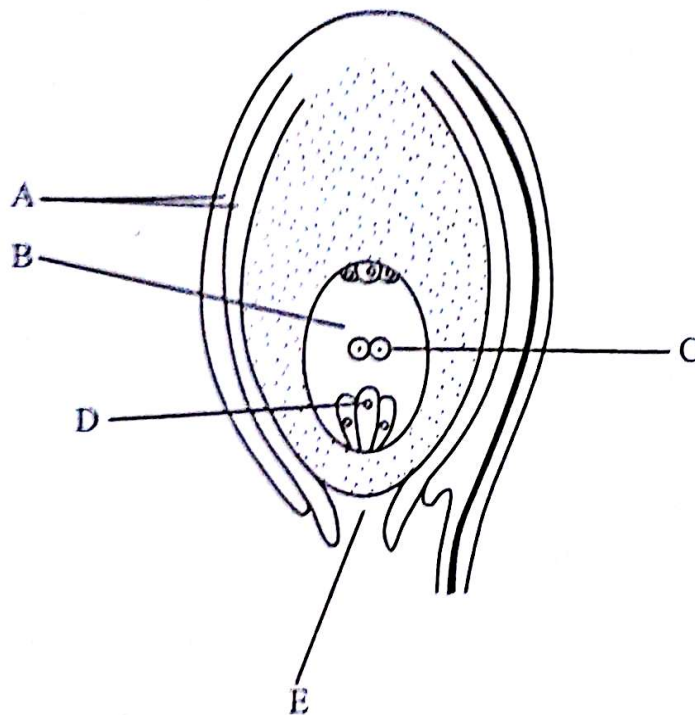


Section A [60 marks]

Answer all questions in this section.

Candidates are advised to spend approximately 80 minutes on this section.

- 1 (a) The diagram below shows the longitudinal section of an unfertilised ovule from a flower.



Name the parts labelled:

- (i) A,

_____ [1]

- (ii) E.

_____ [1]

(b) Complete the table below, indicating the number of chromosome sets present in a cell of each structure.

| Structure | Name of structure | Number of chromosome sets |
|-----------|-------------------|---------------------------|
| B | Antipodal cell | |
| C | Polar nucleus | |
| D | Egg nucleus | |

[3]

(c) Explain the role of plant growth regulators in fruit development.

[5]

2 (a) Differentiate between hypogeal and epigeal germination.

[3]

(b) Explain the role of water in seed germination.

[3]

(c) Describe one on-farm seed viability test.

[4]

3 (a) What are the importance of the following soil properties in crop production?

(i) Soil colour,

[3]

(ii) Soil texture,

[2]

(b) Suggest any five soil management practices that can be carried out to improve crop productivity.

[5]

4 (a) Explain the role of the following micronutrients in plant growth and development:

(i) boron,

[3]

(ii) zinc.

[3]

- (b) Results of a soil analysis show that there is a deficiency of nitrogen in the soil. The recommended application rate is 100 kg/ha of nitrogen. How many 50 kg bags of Ammonium Nitrate fertiliser (34.5% Nitrogen) are required to meet the recommended rate?

[4]

5 Taku had **three** plants S, T and U. Plant S and T had red flowers whereas plant U had white flowers. By means of plant brush, he pollinated plant S with pollen from plant U and plant U with pollen from plant T. The first cross (S and U) produced plants which all had red flowers while the second cross (T and U) produced some plants with red flowers and some with white flowers.

- (a) (i) Which of the three original plants was heterozygote?

_____ [1]

- (i) Comment on the red and white alleles.

_____ [1]

(b) What is the approximate ratio of red to white flowered plants in the offspring of the cross between T and U?

[2]

(c) Using **R** to represent the allele for red flower and **r** the allele for white flower, write down the genotypes of the **three** parent plants **S**, **T** and **U**.

[3]

(d) Outline the basic steps in hybrid seed production.

[3]

6 (a) Outline any **five** economic importance of weeds in crop production.

[5]

(b) Describe the following cultural methods of pest management:

(i) planting time,

[2]

(ii) crop rotation.

[3]

Section B [40 marks]

Answer any two questions only from this section.

- 7 Describe production of a **named** legume crop under the following headings:
- (i) tillage practices, [8]
 - (ii) plant population, [6]
 - (iii) weed management. [6]
- 8 (a) Outline the importance of conservation farming. [12]
- (b) Write short notes on:
- (i) stubble mulch tillage, [5]
 - (ii) minimum tillage. [3]
- 9 (a) Outline how farmers can reduce the weed seed bank in arable lands. [10]
- (b) Discuss the justification of environmentalists against the use of herbicides in crop production. [10]
- 10 (a) Discuss ways of enhancing the production of a named cereal in the low rainfall areas of Zimbabwe. [12]
- (b) Explain the benefits of using open pollinated varieties in the production of legume crops. [8]