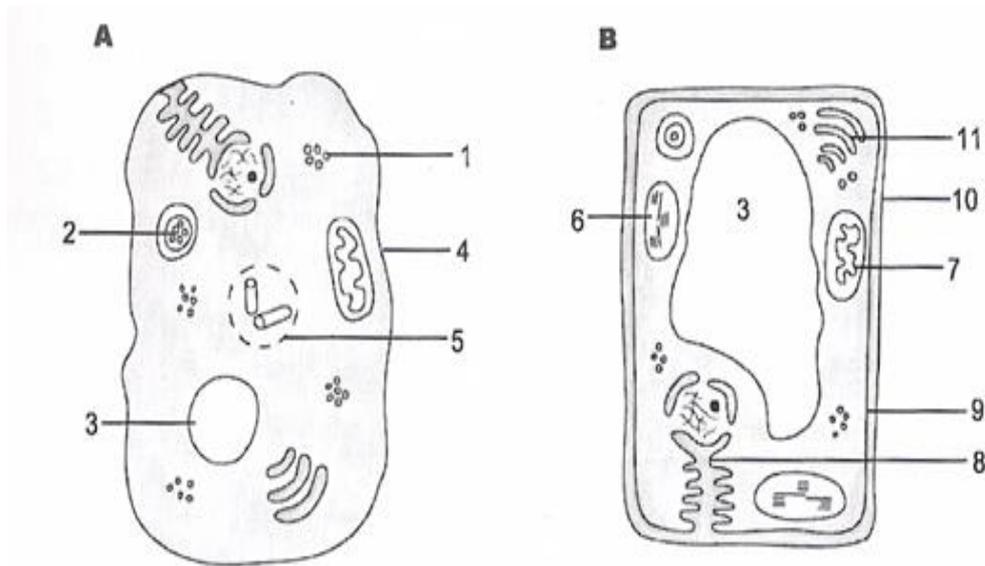


4 June

2.1 Study the following diagrams of cells and answer the questions that follow.



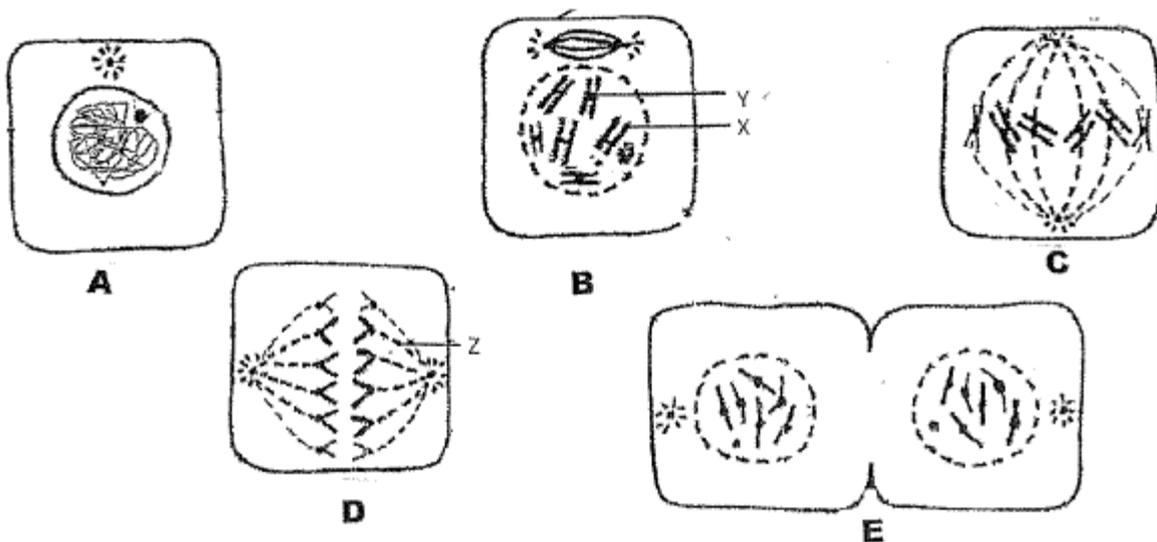
2.1.1 Which diagram, A or B represents the plant cell? (1)

2.1.2 Tabulate two visible differences between cell A and B. (4)

2.1.3 Structure 3 plays an important role in cell B. List TWO functions of this structure. (2)

2.1.4 Name the organic substance that part 10 in cell B mainly consists of. (1)
(8)

2.2 The diagrams below show the different phases of Mitosis.

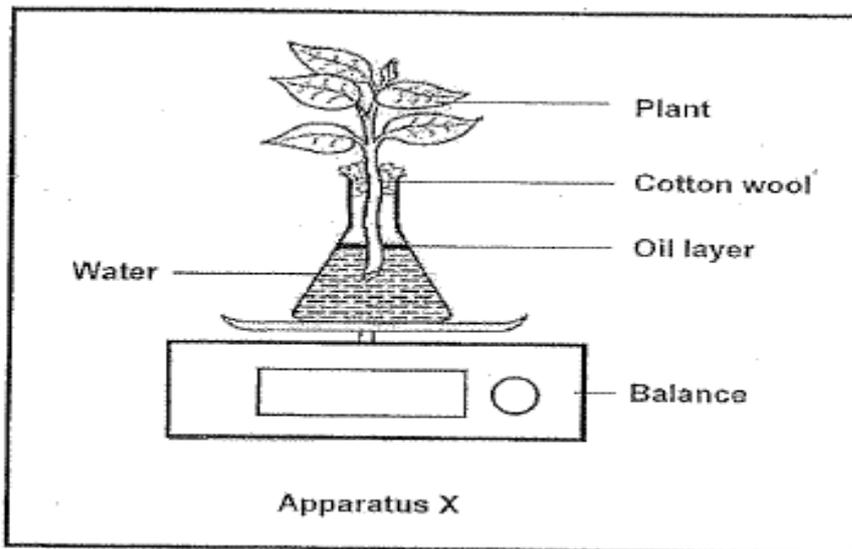


- 2.2.1 Identify the phases labelled B, C and D and state a visible reason to motivate your choice. (6)
- 2.2.2 Write down the number of chromosomes in a daughter cell at the end of the process above. (1)
- 2.2.3 Label structures X, Y and Z. (3)
- 2.2.4 State TWO reasons why mitosis is a biologically important process. (2)

(12)

2.3. An investigation was carried out to study the effect of light intensity on the opening and closing of the stomata.

1. Apparatus X (shown in the diagram below) was used to measure the rate of water loss from the leaves at several light intensities.
2. At each light intensity, the apparatus was left for 15 minutes before starting measurements.
3. The water loss was recorded in the dark and at four different light intensities.



The results of this investigation are shown in the table below.

| Light intensity (kilolux) | Loss of water (g/hour) |
|---------------------------|------------------------|
| 0 | 1 |
| 10 | 15 |
| 20 | 20 |
| 30 | 22 |
| 40 | 20 |

- 2.3.1 State the dependant variable in the above investigation. (1)
- 2.3.2 Which evidence supports the statement that the stomata are fully open at a light intensity of 30 kilolux? (1)
- 2.3.3 What is the purpose of the oil layer over the water surface in the flask? (1)
- 2.3.4 Why is the apparatus left for 15 minutes at each new light intensity before starting the measurements? (1)
- 2.3.5 Predict how the results would be influenced by a lower temperature. (1)

(5)

- 2.4 A survey was carried out at a local school. The findings of the survey detailing the nutritional content of the learners' breakfasts and the learners' concentration spans are given in the table below.

| LEARNER NAME | CONCENTRATION SPAN | PROTEIN % | CARBOHYDRATES % | SUGAR % |
|--------------|--------------------|-----------|-----------------|---------|
| Jamie | 1 hour | 15 | 20 | 65 |
| Sipho | 3 hours | 75 | 20 | 5 |
| Stefan | 30 minutes | 5 | 30 | 65 |
| Thembi | 2 1/2 hours | 40 | 40 | 20 |
| Benny | 4 hours | 85 | 15 | 0 |

- 2.4.1 Provide a hypothesis for the above investigation. (2)
- 2.4.2 What advice would you give to Jamie in order to improve his concentration span at school? (2)
- 2.4.3 State THREE planning steps for this investigation. (3)
- 2.4.5 While Benny was eating his breakfast, he messed some egg yolk on his school shirt. His mom washed the shirt at a very high temperature using an enzyme enriched washing powder, but the stain did not come out of his shirt. Suggest a reason why this happened. (2)
- 2.4.6 On the same system of axes, draw a bar graph to indicate the protein and carbohydrate content of the learners' breakfast. (6)

(15)