Write your name and index number in ink in the spaces provided above.

Answer all the questions.

Write your answers in the answer booklet provided.

Credit will be given for clarity of expression, orderly presentation of material and for answers which show that you have had the required practical experience.
1. Figure 1 below illustrates a set-up used for an experiment to demonstrate photosynthesis in green plants. Study the diagram carefully and use it to answer the questions that follow.

![Diagram of a photosynthesis experiment set-up]

(a) Name the parts labelled I, II, III and IV.

(b) State one function of each of the following substances used in the experiment:

(i) lime water;
(ii) caustic soda;
(iii) black polythene bag.

(c) State the importance of the set-up B in this experiment.

(d) In which of the set-ups A and B, would the leaves show a positive test for starch? Give one reason to support your answer in (d) (i).

(e) State two precautions to be taken in setting up this experiment.

(f) Suggest the aim of the experiment.

2. In an experiment to determine the velocity of a moving body, the displacements, \( d = d_1, d_2, d_3, d_4 \) and \( d_5 \) of the body and the corresponding times, \( t = t_1, t_2, t_3, t_4 \) and \( t_5 \) taken were determined.

Figure 2a represents the displacements, \( d = d_1, d_2, d_3, d_4 \) and \( d_5 \), while Figure 2b represents the corresponding times, \( t = t_1, t_2, t_3, t_4 \) and \( t_5 \).

Study the figures carefully and answer the questions that follow.

![Diagram of displacements and times]

Fig. 2a. Displacements, \( d \), in centimetres
Fig. 2b. Stop clock showing time, $t$ in seconds

(a) Measure and record the raw displacements, $d = d_1, d_2, d_3, d_4$, and $d_5$.
(ii) Read and record the times, $t = t_1, t_2, t_3, t_4$, and $t_5$.
(iii) Convert the raw values of displacements recorded in (a) (i) to actual displacements, $D = D_1, D_2, D_3, D_4$, and $D_5$ using the scale $1 \text{ cm} = 10 \text{ m}$.
(iv) Tabulate your results obtained in (a) (i), (a) (ii), and (a) (iii) as shown below.

<table>
<thead>
<tr>
<th>$t$/s</th>
<th>$t_1$</th>
<th>$t_2$</th>
<th>$t_3$</th>
<th>$t_4$</th>
<th>$t_5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw value of $d$/cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual value of $D$/m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[7 marks]

(b) Plot a graph with actual displacements $D$ on the vertical axis and times, $t$ on the horizontal axis. [5 marks]

c) (i) Determine the slope of the graph.
(ii) State the significance of the slope of the graph determined in (c) (i). [3 marks]

3. Figure 3 illustrates three different methods of crop propagation. Study the figure carefully and answer the questions that follow.

(a) Name the parts labelled I, II, III, and IV. [2 marks]

(b) Identify each of the methods of propagation in A, B, and C. [3 marks]

Turn over
Given a citrus seedling, a mature citrus plant, a knife and a wrapping tape, describe how the propagation method would be performed as illustrated in set-up B above. [4 marks]

State three factors that influence the success of the method of propagation illustrated in C above. [3 marks]

Name one ornamental plant propagated by the method illustrated in A. [1 mark]

State four advantages of the methods of propagation illustrated above. [4 marks]

Figure 4 below illustrates a set-up for the titration of 0.2 M hydrochloric acid against 25.0 cm³ of a solution of sodium hydroxide.

1. Study the figure carefully and answer the questions that follow.

Name the parts labelled, I, II, III, IV, V and VI. [6 marks]

State one function of each of the parts labelled III, IV and VII. [6 marks]

Write a balanced chemical equation for the reaction that takes place between the hydrochloric acid and the sodium hydroxide. [2 marks]

Assuming the volume of acid is 28.0 cm³, calculate the number of moles of sodium hydroxide in 100 cm³ of the sodium hydroxide solution. [5 marks]

State two precautions to be taken when carrying out an experiment with the set-up illustrated above. [2 marks]

What would be the effect on the titration result if droplets of acid are found in the space labelled V? [2 marks]

END OF PAPER
Visit Larnedu.com for more WASSCE / WAEC past questions.