Level 3 Certificate and Extended Certificate in Applied Science

KEY CONCEPTS IN SCIENCE

Unit Number: ASC1

Section A – ASC1/B (Biology)

Tuesday 23 January 2018     Morning     Time allowed: 1 hour 30 minutes

You are advised to spend approximately 30 minutes on this section.

Materials
For this paper you must have:
• a calculator
• formulae sheet.

Instructions
• Use black ink or black ball-point pen.
• Answer all questions in each section.
• You must answer the questions in the spaces provided.
• Do not write outside the box around each page or on blank pages.
• Do all rough work in this book. Cross through any work you do not want to be marked.

Information
• You will be provided with a copy of the formulae sheet.
• There are three sections in this paper:
  Section A – Biology  Section B – Chemistry  Section C – Physics.
• The marks for questions are shown in brackets.
• The maximum mark for this paper is 60 and the maximum mark for this section is 20.

Advice
Read each question carefully.
Photosynthesis is a process of carbon capture.

Name the two raw materials needed for photosynthesis in grass, and give the source for each raw material. 

[2 marks]

Material 1  _____________________________________________________________________
Source  ________________________________________________________________________
Material 2  _____________________________________________________________________
Source  ________________________________________________________________________

Figure 1 shows the equipment used by a student to investigate the rate of photosynthesis.

The equipment was set up in sunlight.

Figure 1
The student used the following standard procedure.
1 Collect the gas given off by the plant in the funnel for 30 minutes.
2 Use the syringe to pull the gas into the capillary tubing.
3 Record the volume of gas using the scale.
4 Repeat steps 1–3 after 2, 4, 6, 8, 10 and 12 hours.

The student’s results are shown in **Figure 2**.

![Figure 2](image)

**Figure 2**

Use information from **Figure 1** and **Figure 2** to answer the following questions.

### 01.2

Which stage of photosynthesis produced the results shown in **Figure 2**?

Give an explanation for your answer.

[3 marks]

Stage __________________________________________

Explanation __________________________________________

________________________________________________________

________________________________________________________

________________________________________________________

________________________________________________________

### 01.3

Suggest a possible reason for the results at 4.0–4.5 hours and 12.0–12.5 hours in **Figure 2**.

[1 mark]

________________________________________________________
ATP is used to release energy for cell activity.

Figure 3 shows a molecule of adenosine diphosphate (ADP).

![Figure 3](image)

Complete Figure 3 to show a molecule of ATP. [1 mark]

ATP is produced during the different stages of respiration.

Complete Table 1 to show which site each stage of respiration occurs in.

Tick (✓) three boxes. [3 marks]

<table>
<thead>
<tr>
<th>Site of each stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage of respiration</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Glycolysis</td>
</tr>
<tr>
<td>Krebs cycle</td>
</tr>
<tr>
<td>Electron Transfer Chain</td>
</tr>
</tbody>
</table>
Describe how ATP is used and produced during glycolysis. [3 marks]

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There are two types of respiration: aerobic and anaerobic.

Give one advantage of aerobic respiration compared with anaerobic respiration. [1 mark]

________________________________________________________________________________

Turn over for the next question
A woman visits a very hot country. Her body helps to control her core body temperature by sweating.

What is the normal body temperature range? [1 mark]

From ________________ °C to ________________ °C

The woman starts to feel ill because her blood pressure is too low. The low blood pressure was caused by sodium chloride deficiency.

Give two symptoms the woman would experience due to low blood pressure. [2 marks]

1  ______________________________________________________________________________
   ______________________________________________________________________________

2  ______________________________________________________________________________
   ______________________________________________________________________________

Describe how the adrenal cortex responds to the low blood pressure. [3 marks]

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END OF QUESTIONS
There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED