For this paper you must have:
• a ruler.
You may use a calculator.

Time allowed
• 1 hour

Instructions
• Use black ink or black ball-point pen.
• Fill in the boxes at the top of this page.
• Answer all questions.
• You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
• Do all rough work in this book. Cross through any work you do not want to be marked.

Information
• The marks for questions are shown in brackets.
• The maximum mark for this paper is 60.
• You are expected to use a calculator where appropriate.
• You are reminded of the need for good English and clear presentation in your answers.
Answer all questions in the spaces provided.

1 A Scenes of Crime Officer (SOCO) investigated a crime scene.

The diagrams show the equipment she might have used to collect the evidence found at the crime scene.

Cotton swab  Plaster of Paris  Scalpel
Tweezers  Sticky tape

1 (a) Complete the table to show which equipment she used to collect each of the pieces of evidence found at the crime scene.

<table>
<thead>
<tr>
<th>Evidence found</th>
<th>Equipment used to collect the evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dried blood</td>
<td></td>
</tr>
<tr>
<td>Hair</td>
<td></td>
</tr>
<tr>
<td>Wet blood</td>
<td></td>
</tr>
<tr>
<td>Fingerprints</td>
<td></td>
</tr>
</tbody>
</table>

(4 marks)
1 (b) (i) Give two pieces of information that the SOCO could obtain from the sample of blood found at the crime scene.

1 .......................................................................................................................................................... 

2 .......................................................................................................................................................... 

(2 marks)

1 (b) (ii) Blood contains many organic substances.

What does organic mean?

Draw a ring around the correct answer.

contains oxygen comes from living things contains calcium

(1 mark)

1 (c) The SOCO also found a cigarette end in an ashtray. She collected it for DNA analysis.

What might be left on the cigarette end that would contain DNA?

Draw a ring around the correct answer.

saliva nicotine tar

(1 mark)

1 (d) The SOCO wore special clothing when she collected evidence from the crime scene.

1 (d) (i) Name two items of special clothing worn by the SOCO.

1 ..........................................................................................................................................................

2 ..........................................................................................................................................................

(2 marks)

1 (d) (ii) Give one reason why the SOCO wore special clothing when she collected the evidence from the crime scene.

................................................................................................................................................................

................................................................................................................................................................

(1 mark)

Turn over for the next question
There are no questions printed on this page
A hospital dietician makes sure that children who are in hospital get enough vitamins in their diet.

Different vitamins have different functions.

2 (a) (i) Vitamins A, B, C, E and K are found in food.

Complete the table by writing A, B, C, E or K next to its correct function.

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>healthy gums, absorption of iron</td>
</tr>
<tr>
<td></td>
<td>release of energy from food</td>
</tr>
<tr>
<td></td>
<td>healthy eyesight</td>
</tr>
<tr>
<td></td>
<td>clotting of blood</td>
</tr>
</tbody>
</table>

(4 marks)

2 (a) (ii) Vitamin D is important for the absorption of calcium.

Why is calcium important for children?

...................................................................................................................................
............................................................................................................................ .......

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(1 mark)

2 (a) (iii) Which food is a good source of vitamin D?

Draw a ring around the correct food.

lettuce                        liver                        orange

(1 mark)

Question 2 continues on the next page
2 (b) The dietician told the children that they must have plenty of fruit or vegetables to get vitamin C.

The table shows the vitamin C content of 14 common fruits.

<table>
<thead>
<tr>
<th>Fruit</th>
<th>milligrams vitamin C per 100 grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>6</td>
</tr>
<tr>
<td>Banana</td>
<td>9</td>
</tr>
<tr>
<td>Blackcurrant</td>
<td>180</td>
</tr>
<tr>
<td>Grape</td>
<td>11</td>
</tr>
<tr>
<td>Grapefruit</td>
<td>34</td>
</tr>
<tr>
<td>Kiwifruit</td>
<td>98</td>
</tr>
<tr>
<td>Orange</td>
<td>50</td>
</tr>
<tr>
<td>Peach</td>
<td>7</td>
</tr>
<tr>
<td>Pear</td>
<td>4</td>
</tr>
<tr>
<td>Pineapple</td>
<td>15</td>
</tr>
<tr>
<td>Plum</td>
<td>10</td>
</tr>
<tr>
<td>Raspberry</td>
<td>25</td>
</tr>
<tr>
<td>Strawberry</td>
<td>57</td>
</tr>
<tr>
<td>Tangerine</td>
<td>30</td>
</tr>
</tbody>
</table>

2 (b) (i) Which fruit has got the most vitamin C per 100 g?

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(1 mark)

2 (b) (ii) Which fruit has got the lowest amount of vitamin C per 100 g?

............................................................................................................................

(1 mark)
2. (b) (iii) The Recommended Daily Allowance (RDA) for vitamin C is 60 mg. How many grams of tangerines would you need to eat in a day to receive your RDA of vitamin C? Show your working.

...................................................................................................................................
...................................................................................................................................

Answer .................... grams

(2 marks)

2. (b) (iv) Vitamin C is sometimes used as an additive in food. Draw a ring around the correct reason for adding vitamin C to food.

antioxidant preservative thickener

(1 mark)

2. (c) The dietician also makes sure the children are getting the correct amount of fat in their diet. Draw a ring around the main use of fat in the diet.

energy growth repair

(1 mark)

Turn over for the next question
The following nutritional information was found on a jar of a meal supplement for a weightlifter and a jar of meal supplement for a runner.

<table>
<thead>
<tr>
<th>Nutritional Information</th>
<th>Weightlifter</th>
<th>Runner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per 25 g serving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>98.6 kcal</td>
<td>109 kcal</td>
</tr>
<tr>
<td>Protein</td>
<td>19.5 g</td>
<td>3.85 g</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>1.0 g</td>
<td>15.27 g</td>
</tr>
<tr>
<td>Fat</td>
<td>1.7 g</td>
<td>3.7 g</td>
</tr>
</tbody>
</table>

3 (a) (i) Which nutrient is most important to the weightlifter?

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(1 mark)

3 (a) (ii) Why is this nutrient important to the weightlifter?

............................................................................................................................

............................................................................................................................

(1 mark)

3 (a) (iii) Suggest why the supplement for the runner has more carbohydrate.

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............................................................................................................................

(1 mark)

3 (a) (iv) Which foods in the list contain a lot of carbohydrate?

Draw a ring around two foods.

- biscuit
- bacon
- eggs
- potato
- tomato

(1 mark)
3  (b)  (i)  A sports physiologist tested the runner’s urine to see if it contained any sugar (glucose).

Describe how the sports physiologist could find out if there was any glucose in the urine.

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(2 marks)

3  (b)  (ii)  Use words from the box to complete the sentences about the control of blood sugar.

| decrease | glucagon | heart | increase | insulin | pancreas |

When you eat a sugary snack or meal it will make the level of glucose in the blood ..........................................................

The brain sends a message to the ......................................................... to release a hormone called ......................................................... which reduces the level of glucose in the blood.

(3 marks)
4 A forensic scientist examined the ink found on a ransom note.

He used paper chromatography to compare the ink found on the ransom note with the ink from three pens.

4 (a) Use words from the box to complete each sentence about chromatography.

<table>
<thead>
<tr>
<th>compound</th>
<th>mixture</th>
<th>quickly</th>
<th>slowly</th>
<th>solvent</th>
</tr>
</thead>
</table>

4 (a) (i) Chromatography is a method used to identify chemicals in a ............................................................... .

                        (1 mark)

4 (a) (ii) The chemicals dissolve in a ............................................................... .

                        (1 mark)

4 (a) (iii) The substance that is the most soluble travels more ................................................ up the paper.

                        (1 mark)

4 (b) Describe how the forensic scientist would produce a chromatogram to compare the different inks.

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                        (3 marks)
4. (c) The diagram shows the chromatogram of ink A from the ransom note and the inks B, C and D from the three pens.

4 (c) (i) Which ink, A, B, C or D, does not contain a mixture of colours? Write your answer in the box.

4 (c) (ii) Explain your answer to (c)(i).

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(1 mark)

4 (d) The ink A from the ransom note was the same as the ink from a pen found on a suspect.

4 (d) (i) Which ink, B, C or D, matches the ink from the ransom note?

(1 mark)

4 (d) (ii) This does not prove that the note was written by the suspect.

Explain why.

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........................................................................................................................................

(1 mark)
Many farmers keep chickens. Chickens can be reared on organic farms.

The table shows the numbers of chickens (in millions) reared on organic farms in the UK from 2004–2007.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of organic chickens (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>2.2</td>
</tr>
<tr>
<td>2005</td>
<td>2.5</td>
</tr>
<tr>
<td>2006</td>
<td>3.5</td>
</tr>
<tr>
<td>2007</td>
<td>4.4</td>
</tr>
</tbody>
</table>

(a) (i) Use the data in the table to plot a bar chart.
5 (a) (ii) Describe what the bar chart shows.
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(1 mark)

5 (a) (iii) Suggest a reason for your answer to 5(a)(ii).
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(1 mark)

5 (b) (i) Describe how chickens are reared on organic farms.
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........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

(2 marks)

5 (b) (ii) Give two disadvantages to the farmer of rearing chickens on organic farms.
1 ........................................................................................................................................
2 ........................................................................................................................................

(2 marks)

Turn over for the next question
6 The diagram shows a golf club and details of the covering of the handle.

6 (a) (i) Suggest a type of material from which the covering of the handle could be made.

........................................................................................................................................

(1 mark)

6 (a) (ii) Suggest why the covering of the handle has an uneven (dimpled) surface.

........................................................................................................................................

........................................................................................................................................

(1 mark)
6 (b) The table shows some properties of materials used in the manufacture of golf clubs.

<table>
<thead>
<tr>
<th>Property</th>
<th>Titanium</th>
<th>Aluminium</th>
<th>Steel</th>
<th>Carbon fibre reinforced plastic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (g/cm$^3$)</td>
<td>4.5</td>
<td>2.7</td>
<td>7.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Strength (GPa)</td>
<td>120</td>
<td>70</td>
<td>200</td>
<td>150</td>
</tr>
<tr>
<td>Melting point ($^\circ$C)</td>
<td>1668</td>
<td>660</td>
<td>1370</td>
<td>250</td>
</tr>
<tr>
<td>Corroses</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Hardness (10=hard)</td>
<td>6</td>
<td>2.7</td>
<td>4.2</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Use the information in the table to answer the following questions.

6 (b) (i) Give two advantages of using carbon fibre reinforced plastic for the shaft of the golf clubs.

1 ..................................................................................................................................

2 ..................................................................................................................................

(2 marks)

6 (b) (ii) The heads of some golf clubs are made of titanium.

Give two reasons why this metal is used.

1 ..................................................................................................................................

2 ..................................................................................................................................

(2 marks)

6 (c) What type of material is carbon fibre reinforced plastic?

..........................................................................................................................................

(1 mark)

Question 6 continues on the next page
6 (d) Golf shoes can be made from leather, which is a natural material, or from a synthetic material.

Give **two** advantages of making the golf shoes out of a synthetic material rather than leather.

1 ...........................................................................................................................................

...........................................................................................................................................

2 ...........................................................................................................................................

...........................................................................................................................................

(2 marks)

END OF QUESTIONS