This is a collection of questions that reflect the CONTENT covered in this module, and not necessarily the TEST.
Q1. The drawing shows a baby inside its mother’s uterus.

Some substances pass from the mother’s blood to the baby’s blood. Other substances pass from the baby’s blood to the mother’s blood.

Which way, if any, do the substances in the table pass? Tick one box in each row.

<table>
<thead>
<tr>
<th>substance</th>
<th>passes from the mother’s blood to the baby’s blood</th>
<th>passes from the baby’s blood to the mother’s blood</th>
<th>does not pass between the mother’s blood and the baby’s blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>poisons from cigarette smoke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>oxygen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>digested food</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>carbon dioxide</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 marks

Q2. Choose words from the box below to answer all the questions.

<table>
<thead>
<tr>
<th>cell division</th>
<th>digestion</th>
<th>fertilisation</th>
<th>foetus</th>
<th>genes</th>
</tr>
</thead>
<tbody>
<tr>
<td>intestine</td>
<td>ovary</td>
<td>ovum (egg)</td>
<td>sperm</td>
<td>testis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>uterus</td>
</tr>
</tbody>
</table>
(a) A

(i) What is the name of cell A?
.........................................................................................................................
1 mark

(ii) Where is cell A produced?
.........................................................................................................................
1 mark

(b) B

(i) What is the name of cell B?
.........................................................................................................................
1 mark

(ii) Where is cell B produced?
.........................................................................................................................
1 mark

(c) C

What process is shown in C? Choose your answer from the box above.
.........................................................................................................................
1 mark
(d) The diagram shows a baby developing inside its mother.

(i) Which word means an unborn baby? Choose your answer from the box above.

............................................................... 1 mark

(ii) Where does the unborn baby develop? Choose your answer from the box above.

............................................................... 1 mark

maximum 7 marks

Q3. (a) The average life span of a lion in a zoo is 22 years. The average life span of a lion in the wild is 17 years.

Suggest two reasons why lions live longer in a zoo than in the wild.

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

2. ........................................................................................................................................................... 1 mark
(b) John found the following data about five mammals.

<table>
<thead>
<tr>
<th>mammal</th>
<th>average length of pregnancy (days)</th>
<th>average life span (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mouse</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>guinea pig</td>
<td>65</td>
<td>7</td>
</tr>
<tr>
<td>leopard</td>
<td>96</td>
<td>15</td>
</tr>
<tr>
<td>chimpanzee</td>
<td>250</td>
<td>40</td>
</tr>
<tr>
<td>whale</td>
<td>315</td>
<td>50</td>
</tr>
</tbody>
</table>

He plotted points using data from the table.

(i) Using the points John plotted, draw a line of best fit.  
1 mark

(ii) From the graph, describe the relationship between the average length of pregnancy and the average life span.

...............................................................................................................
...............................................................................................................
...............................................................................................................
1 mark
(c) John found data about three other mammals.

<table>
<thead>
<tr>
<th>mammal</th>
<th>average length of pregnancy (days)</th>
<th>average life span (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human</td>
<td>266</td>
<td>72</td>
</tr>
<tr>
<td>Horse</td>
<td>340</td>
<td>25</td>
</tr>
<tr>
<td>Giraffe</td>
<td>440</td>
<td>17</td>
</tr>
</tbody>
</table>

(i) Plot these three points on the graph above.  

(ii) Do these points fit the relationship you described in part (b) (ii)? 
Tick the correct box.

```markdown
yes [ ] no [ ]
```

Use the graph to give a reason for your answer.

```
...............................................................................................................
...............................................................................................................
```

1 mark
maximum 6 marks
Q4. Diagram 1 shows a baby in its mother’s uterus.

(a) What is the normal length of pregnancy in humans?
.................... months

(b) 
(i) What is the function of the amniotic fluid around the baby?
.................................................................................................................................

(ii) As a baby is born, it is pushed out of the mother’s body.

Look at the diagram above.

What happens in the wall of the uterus to push the baby out?
.................................................................................................................................
.................................................................................................................................

(c) How does a baby get oxygen from its mother while it is inside its mother’s uterus?
.................................................................................................................................
.................................................................................................................................
(d) **Diagram 2** shows a section through the mother’s lungs.

Look at **diagram 2**.

From which labelled part is oxygen absorbed into the blood?

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

1 mark  
maximum 5 marks

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Q5. **Diagram 1** shows the female reproductive system.

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

1 mark  
maximum 5 marks
Diagram 2 is a graph showing how the thickness of the uterus changed over a 28-day cycle.

(i) Why did the thickness of the lining of the uterus decrease between day 1 and day 5 of this cycle?
................................................................................................................
................................................................................................................

1 mark

(ii) Suggest which day in this cycle an ovum (egg) is most likely to be fertilised.

day ............

What evidence is there for this in the graph?
................................................................................................................
................................................................................................................

1 mark

(iii) The graph shows that the lining of the uterus builds up again between day 5 and day 14.

Why is this necessary?
................................................................................................................
................................................................................................................

1 mark

(b) (i) Continue the line on the graph to show what would happen to the thickness of the lining of the uterus after 28 days if an ovum was fertilised.

1 mark
Q6. Some pupils carried out an investigation to find out whether more sugar or more salt dissolved in water at 60°C.

Here are some of the steps in their investigation. They are not in the correct order.

(a) Put the letters A, B, C, D and E in the boxes below to show the correct order of the steps in their investigation.

1st [ ] 2nd [ ] 3rd [ ] 4th [ ] 5th [ ]

1 mark

(b) Why did they use a measuring cylinder?

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

1 mark
(c) They used water at 60°C in both beakers.

What else did they do to make their investigation fair?

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

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

1 mark

(d) They counted the number of spatulas of sugar or salt added to the water until no more would dissolve.

(i) Why was this not an accurate method of measuring how much sugar or salt they added?
................................................................................................................................................
................................................................................................................................................
................................................................................................................................................

1 mark

(ii) Suggest a more accurate method of measuring how much sugar or salt they added.
................................................................................................................................................
................................................................................................................................................
................................................................................................................................................

1 mark

(e) Jane predicted that more sugar than salt would dissolve.

Complete the table to show a result which would support Jane’s prediction.

<table>
<thead>
<tr>
<th>number of spatulas</th>
<th>sugar</th>
<th>salt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>

1 mark

maximum 6 marks
Q7. Chris collected some sea water near a beach. The sea water had salt dissolved in it. It had sand mixed in it.

(a) Chris separated the sand from the salt water as shown below.

\[ \text{flask} \quad \text{salt water} \]

(i) What is this method of separation called? Tick the correct box.

- chromatography
- distillation
- filtration
- magnetism

(ii) What is substance A?

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

(iii) What is the part labelled B?

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

3 marks

(b) Chris poured some of the salt water from the flask into a dish. He put the dish on a balance and left it in a warm room for a week.
(i) Look at the two readings on the balance.
Work out the decrease in mass.
............. g

(ii) After one week there was a white solid but no liquid in the dish.
What had happened to the water in the dish?
..............................................................................................................

(iii) What was the white solid left in the dish?
.................................................................................................

3 marks
maximum 6 marks
Q8. Susie used chromatography to identify the coloured substances in the ink from a felt-tip pen.

She used:

- green ink
- blue ink
- purple ink
- ink from her felt-tip pen.

She used water as the solvent.

Look at the diagram above.

(a) (i) Which colours were present in the ink from the felt-tip pen?

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

1 mark

(ii) How many coloured substances were there in green ink?

.........

How can you tell?

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

1 mark
(iii) Susie placed the spots of ink on a line on the chromatography paper as shown in the diagram. To draw the line, Susie had to choose a felt-tip pen or a pencil.

Which one should she use?

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

Give the reason for your answer.

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

............................................................. 1 mark

(b) Susie used water as the solvent in this experiment. When she repeated the experiment with a different set of pens, it did not work. She then used ethanol instead of water.

Suggest why the experiment worked with ethanol but not with water.

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

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

............................................................. 1 mark maximum 4 marks

Q9. (a) The apparatus in the diagram below is used to obtain pure water from impure water.

(i) What temperature would the thermometer show?

................................................. °C 1 mark
(ii) What is the function of the piece of apparatus labelled R?
........................................................................................................................................
........................................................................................................................................
1 mark

(iii) Give the name of the process which purifies water in this way.
............................
1 mark

(b) The diagram below shows particles in a gas, a solid and a liquid. Each arrow, A, B, C and D, represents a change of state.

(i) Choose from the following words to complete the sentences below.
boiling condensing distilling evaporating filtering freezing melting
Change of state A is called .................................................................
Change of state B is called .................................................................
Change of state C is called .................................................................
Change of state D is called ................................................................. 4 marks

(ii) Look back to the apparatus in part (a).
Give the letter, A, B, C or D, from the diagram above, for the change of state which occurs:

in the round-bottomed flask ............................................................
in the piece of apparatus labelled R. ................................................. 2 marks
Maximum 9 marks
Q10. The graph below shows how the solubility of three salts, sodium chloride, potassium chloride and calcium sulphate, changes as the temperature changes.

![Graph showing solubility of salts versus temperature]

(a) (i) Use the graph above to compare the solubility of sodium chloride and potassium chloride in the temperature range 10°C to 90°C.

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

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

2 marks

(ii) Ken had a beaker containing 54 g of potassium chloride dissolved in 100 cm³ of water at 90°C.
He cooled the solution to 40°C.
What would he see in the beaker as the solution cooled to 40°C?
Use the graph to help you.

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

1 mark

Explain your answer.

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

1 mark

(b) The water in a lake had the three salts dissolved in it. The water evaporated from the lake and the salts were deposited in layers in the order shown below.

[Image of salt layers: potassium chloride, sodium chloride, calcium sulphate]
Look at the graph above.

(i) What evidence is there that these three salts were deposited at a temperature above 25°C?

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

1 mark

(ii) In what order would the salts be deposited at 10°C?

top......................................................
middle..................................................
bottom............................................... 1 mark

maximum 6 marks

Q11. (a) The drawing below shows the parts of a torch.

(i) Paul closed the switch. Why did this turn on the torch?

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

.................................................................................................................................................... 1 mark
(ii) The diagrams below show symbols for a battery, a bulb and a switch. Connect the symbols to make a series circuit for the torch.

---

 bulb

---

 battery

 switch

1 mark

(b) The drawings below show two other torches. In both torches, the bulbs will not light even when Paul closes the switches.

Look carefully at the drawings.

(i) Why is the circuit of torch A not complete?

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

1 mark

(ii) What could you do to torch B to get the bulb to light?

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

1 mark
(c) When Paul bought his torch there was a paper strip between the contacts of the switch as shown below.

Paul had to remove the paper strip before he could turn the torch on. Give the reason for this.

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

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

1 mark
maximum 5 marks
(a) Draw a line from each circuit symbol below to the correct name. Draw only four lines.

<table>
<thead>
<tr>
<th>circuit symbol</th>
<th>name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ammeter</td>
</tr>
<tr>
<td></td>
<td>switch</td>
</tr>
<tr>
<td></td>
<td>motor</td>
</tr>
<tr>
<td></td>
<td>battery</td>
</tr>
<tr>
<td></td>
<td>bulb</td>
</tr>
</tbody>
</table>

(b) Fred made **circuit 1** as shown below.

```
circuit 1
```

Give the name of the part that is the energy source for the circuit.

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

1 mark
(c) Fred then made **circuit 2** as shown below.

![circuit 2 diagram](image)

In the table below, tick a box to show whether **circuit 1** and **circuit 2** are series or parallel circuits.

Tick only **two** boxes.

<table>
<thead>
<tr>
<th>series</th>
<th>parallel</th>
</tr>
</thead>
<tbody>
<tr>
<td>circuit 1</td>
<td></td>
</tr>
<tr>
<td>circuit 2</td>
<td></td>
</tr>
</tbody>
</table>

1 mark

(d) What metal is usually used for wires in electric circuits?

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

1 mark

maximum 6 marks

Q13. (a) Max built **circuit 1** as shown below.

![circuit 1 diagram](image)
He closed the switch, S, and all the bulbs came on.
One of the bulbs then broke and all the bulbs went off.

Which bulb must have broken?
Give the letter.

............. 1 mark

(b) Max built circuit 2 as shown below.
He connected a plastic comb and a metal key in different parts of the circuit.

Look carefully at circuit 2.
Complete the table below to show which bulbs in circuit 2 will be on or off when different switches are open or closed.
Write on or off in the boxes below.

<table>
<thead>
<tr>
<th>switch 1</th>
<th>switch 2</th>
<th>bulb P</th>
<th>bulb Q</th>
<th>bulb R</th>
</tr>
</thead>
<tbody>
<tr>
<td>open</td>
<td>open</td>
<td>off</td>
<td>off</td>
<td>off</td>
</tr>
<tr>
<td>open</td>
<td>closed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>closed</td>
<td>open</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 marks
(c) Max built circuit 3 using a battery, two bulbs and three ammeters.

![Circuit Diagram]

The current reading on ammeter $A_1$ was 0.8 amps. What would be the reading on ammeters $A_2$ and $A_3$? Place one tick in the table by the correct pair of readings.

<table>
<thead>
<tr>
<th>reading on ammeter $A_2$ (amps)</th>
<th>reading on ammeter $A_3$ (amps)</th>
<th>correct pair of readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>0.8</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>0.4</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>0.4</td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Q14. Lorna built the circuit drawn below. All the bulbs are identical.

![Circuit Diagram]
(a) Complete the table below by writing **on** or **off** for each bulb.

<table>
<thead>
<tr>
<th>switch</th>
<th>bulb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>S₁</td>
<td>S₂</td>
</tr>
<tr>
<td>open</td>
<td>open</td>
</tr>
<tr>
<td>open</td>
<td>closed</td>
</tr>
<tr>
<td>closed</td>
<td>open</td>
</tr>
<tr>
<td>closed</td>
<td>closed</td>
</tr>
</tbody>
</table>

3 marks

(b) Lorna then built a different circuit as shown below.

![Circuit Diagram]

How could Lorna get both bulbs to light at the same time in this circuit?

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

1 mark
maximum 4 marks
M1.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Passes from the mother’s blood to the baby’s blood</th>
<th>Passes from the baby’s blood to the mother’s blood</th>
<th>Does not pass between the mother’s blood and the baby’s blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>poisons from cigarette smoke</td>
<td>✓</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>oxygen</td>
<td>✓</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>digested food</td>
<td>✓</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>carbon dioxide</td>
<td></td>
<td>✓</td>
<td>1 (L3)</td>
</tr>
</tbody>
</table>

M2.

(a) (i) • sperm

(ii) • testis

   *accept ‘testes’*

(b) (i) • ovum or egg

(ii) • ovary

   *accept ‘ovaries’*

(c) fertilisation

(d) (i) • foetus

(ii) • uterus

[4] [7]
M3. (a) any two from

both answers are required for the mark

• less or no competition for food
• plenty of food or water or they get fed
  accept ‘good or balanced diet’
  ‘they are looked after’ is insufficient
• they have shelter
  accept ‘protected from bad weather’
  ‘protection’ is insufficient because it is not specific
• veterinary or medical treatment
  accept ‘they are vaccinated’
  ‘they get fewer diseases’ is insufficient
  do not accept ‘they are less likely to get a disease’
  accept ‘they are kept healthier’
  ‘they are healthier’ is insufficient
• they are less likely to be injured or killed or there is no hunting of lions
  accept ‘they do not fight as much’
  accept ‘there are no predators of lions’

1 (L5)

(b) (i) • an appropriate line of best fit
  accept a curved or straight line

1 (L6)

(ii) any one from

• animals with longer pregnancies live longer
• the shorter the pregnancy the shorter the life span
  accept ‘the shorter the life span the shorter the pregnancy’
  a comparative answer is required

1 (L5)

(c) (i) • all three points plotted correctly
  accept a tolerance of ± half a small square
  if all three points are correct, award two marks
  if one or two points are correct, award one mark

2 (L5)
(ii) • no ✓
  * if more than one box is ticked, award no mark
  **both** the answer and the correct explanation
  are required for the mark

any one from

• the data is more scattered
  accept 'they do not go up in a straight line'

• there is no link between the number of days pregnant
  and the expected life span
  accept 'they do not fit the line of best fit'

• the human has the longest life span but the shortest pregnancy

• the giraffe has the shortest life span but the longest pregnancy
  accept 'giraffes or horses have a longer pregnancy
  than humans but a shorter life span'

• the (new) points show the longer the pregnancy the
  shorter the life span
  accept the converse
  accept 'they are opposite to the other results'

  1 (L6)

M4. (a) • 9

(b) (i) any one from

• it protects the baby

• it helps to maintain a constant temperature

• it allows the baby to move
  accept 'it keeps it safe'
  accept 'it keeps the baby warm'
  accept 'it absorbs shocks'
  accept 'it protects against infection or disease'

  1 (L6)

(ii) • muscles contract
  accept 'contractions'
  'the uterus or it contracts' is insufficient

  1 (L6)
M5.  (a)  

(i)  any one from

- menstruation
- the lining of the uterus is shed
  accept ‘the period’
  accept ‘the lining of the uterus breaks up’
  accept ‘the wall of the uterus breaks down’
  do not accept ‘the uterus is shed’
  ‘the wall of the uterus breaks’ is insufficient
  both the answer and the correct explanation are required for the mark

(ii) a day from day 14 to day 18
  accept ‘in the middle’
  do not accept ‘around day 14’
  any one from
  - it is just after ovulation or day of ovulation
  - that is when an egg is likely to be in the oviduct or fallopian tube
  - that is just after an egg is released
  - an egg is released on day 14
    accept ‘that is when an egg is released’
    ‘it is in the middle of the cycle’ is insufficient

(b) any one from

- (through the) placenta
- (through the) umbilical cord
- (from the) mother’s blood
  ignore references to food
  ‘through the blood’ is insufficient
  ‘it gets everything from the mother’ is insufficient
  do not accept ‘the mother breathes for the child’

(d)  alveolus

‘air sac’ is insufficient

1 (L5)  1 (L6)
(iii) any one from
  • so that a fertilised egg can be implanted
  • to receive an egg

(b) (i) • a line which continues to rise or remains horizontal after day 28
  accept a line rising or remaining horizontal after day 1

(ii) any one from
  • menstruation stops
    accept 'the embryo or foetus or baby needs a blood supply'
    'provides support' is insufficient
  • so the ovum or embryo will implant
    accept 'the lining is not shed'

M6. (a) E D A B C
  all five letters must be in the correct order

(b) to measure volume
  accept 'to make sure they used the same volume of water in each beaker'
  accept 'to measure amount of water'
  accept 'to measure the volume of salt or sugar'
  'to measure salt or sugar' is insufficient

(c) any one from
  • they used the same volume of water
    accept 'they used the same amount of water'
    accept 'they stirred the same number of times'
    accept 'they stirred at the same speed'
    accept 'they stirred for the same time'
    'they stirred it' is insufficient
(d) (i) any one from

• you might not get the same mass each time
  accept ‘you might not get the same amount of salt or sugar’

• you will not know how much was added
  accept ‘it is not precise or a measurement’
  accept answers which suggest that using a spatula is not a precise measurement

(ii) any one from

• measure the mass
  accept ‘measure weight’ or ‘weigh it’
  accept ‘use a balance or scales’

• measure the number of grams
  accept ‘use grams’
  accept ‘use a measuring cylinder’
  accept ‘level it with a knife’

(e) from 1 – 31 inclusive

M7. (a) (i) filtration ✓

if more than one box is ticked, award no mark

(ii) A: sand

  accept ‘residue’

(iii) B: filter paper

  accept ‘paper’ or ‘filter’
  do not accept ‘funnel’ or ‘filter funnel’
(b) (i) 100

(ii) it had evaporated
  accept 'it went into the air'
  do not accept 'it disappeared'

(iii) salt
  accept 'sodium chloride'
  accept 'salts' or 'minerals' or 'crystals'

M8. (a) (i) pale blue yellow red
  answers may be in any order
  all three answers are required for the mark
  do not accept 'blue' for 'pale blue'

(ii) 2
  because there are two spots on the paper
  accept 'there are two colours from the green ink'
  accept 'because they are straight up from the green ink'
  accept 'it has dark blue and yellow'
  accept 'it shows two'
  both the answer and the correct explanation are required for the mark

(iii) pencil
  both the answer and the correct explanation are required for the mark
  any one from
  • because ink from the felt-tip pen is soluble or will dissolve in water
    accept 'the ink will also produce colours'
    'the pencil has no ink in it' is insufficient
  • because pencil will not spread out or dissolve or run or smudge
    accept 'the ink expands'

[6]
(b) any one from

- the ink would not dissolve in water
  accept ‘the ink was water resistant or permanent or waterproof’
- the ink would dissolve in ethanol
- ethanol is a solvent for the ink
  accept ‘ethanol is a suitable solvent’
  accept ‘ethanol can absorb the ink’
  accept ‘ethanol washes out the ink’
  accept ‘some substances will dissolve in one solvent but not another’

M9. (a) (i) 100
  accept answers from 98 to 100

(ii) to condense the water vapour
  accept ‘to change the gas into liquid’
  or ‘condensation’ or ‘condenser’
  accept ‘to cool the vapour into water’
  do not accept ‘to cool the vapour or water’

(iii) distillation or distilling

(b) (i) evaporating or boiling

melting

freezing

condensing
A
accept 'boiling'

D
accept 'condensing'
accept the letters written in the
correct places on the diagram

M10. (a) (i) any two from

- (the solubility of) potassium chloride and sodium chloride increase
- the difference is smaller at low temperatures or greater at higher temperatures accept 'they both increase'
ignore references to calcium sulphate
- at lower temperatures potassium chloride is less soluble than sodium chloride or at high temperatures potassium chloride is more soluble than sodium chloride accept the converse
- sodium chloride changes less than potassium chloride accept 'the line for potassium chloride is steeper' or 'the line for sodium chloride is flatter'
accept 'sodium chloride is affected less' or 'potassium chloride is affected more'
accept 'sodium chloride hardly changes but potassium chloride increases'
accept 'between 23° and 27° C they are the same'
- at 25°C they are equally soluble accept, for one mark, an answer stating the solubility of both salts at a given temperature other than 25° accept for two marks 'the solubility of potassium chloride increases more than sodium chloride' or 'sodium chloride increases less than potassium chloride'
(ii) any one from

- crystals or solid or particles would appear
- potassium chloride (would be precipitated)
  accept 'it goes cloudy or white'

- any one from

- cooler water cannot dissolve as much potassium chloride
  accept 'less dissolves' or 'at 90° C more dissolves'
- solubility is less at a lower temperature
- the solubility decreases

1 (L7)

(b) (i) any one from

- above 25 °C sodium chloride id deposited before potassium chloride
  accept 'below 25°C there would be a different order'
  accept 'because of the order in which they fell'
- below 25 °C potassium chloride would be deposited before sodium chloride
  accept 'below 25 °C sodium chloride would be above potassium chloride'
- below 25 °C the order would be calcium sulphate, potassium chloride, sodium chloride
  accept 'below 25 °C sodium chloride would be at the top'
- calcium sulphate is the least soluble followed by sodium chloride and then potassium chloride
  accept 'the least soluble was deposited first'

1 (L7)

(ii) sodium chloride
accept sodium
potassium chloride
accept 'potassium'
calcium sulphate
accept calcium
answer must be in the correct order
all three answers are required for the mark
1 (L7)
M11. (a) (i) any one from
• it let the current or electricity flow
• current could flow through the bulb
• it completed the circuit
  accept ‘the contacts came together’

(ii) all three components must be correctly connected in series

Accept

A mark may be awarded for any correctly connected circuit drawn with straight or curved wires
Award a mark for a correct circuit diagram in which the pupil has drawn the symbols instead of connecting the printed symbols

(b) (i) any one from
• the bulb is broken or blown
• the filament is broken
  accept ‘the coil is broken’
  the bulb is not connected properly is insufficient

(ii) turn one of the cells around
  accept ‘turn a battery round’
  accept ‘turn the battery’
  accept ‘put the batteries in the right way’
  ‘turn the batteries round is insufficient’
  the mark may be awarded for a description of the fault
  eg ‘both batteries are the same way up’
(c) any one from

- it stopped current from flowing
  *accept* ‘to stop the batteries running down’
- paper does not conduct or is an insulator
- the circuit was broken or incomplete
  *accept* ‘to stop the contacts coming together’
- so that the circuit can be completed

\[1 \text{ (L3)}\]

M12. (a)

\[\text{all four lines are required for three marks} \]
\[\text{any three lines are required for two marks} \]
\[\text{any two lines are required for one mark} \]
\[\text{if more than one line is drawn from a symbol, do not give credit for that symbol} \]

\[3 \text{ (L4)}\]

(b) battery

*accept* ‘cell’ or ‘cells’
*accept* ‘power supply’ or ‘power pack’

\[1 \text{ (L4)}\]
(c) 

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<tr>
<td>circuit 2</td>
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*both* ticks are required for one mark  
if more than one box is ticked in any row, award no mark

1 (L4)

d) copper  
accept ‘aluminium’  
accept ‘gold’  
do not accept any other metal

1 (L4)  

M13.  

(a) • E

1 (L5)

(b) 

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• on off on  
• off off off  

award one mark for each correct row

2 (L5)

(c) • * 0.8 0.8 ✓  
if more than one box is ticked, award no mark

1 (L6)
(a) 

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award a mark for each correct row

(b) any one from

- close $S_4$ and $S_5$
- only leave $S_3$ open

  accept 'close 4 and 5'
  accept 'only leave 3 open'
  'leave switch 3 or 3 open' is insufficient