Write your name here

Surname	Other names

13+ Scholarship 2026

Subject: Combined Science

Time: 1 Hour

You must have: Pen Pencil	**Total Marks**

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name.
- Answer **all** questions **in each section**.
- Answer the questions in the spaces provided
  - *there may be more space than you need.*
- Show all the steps in any calculations and state the units.

Information

- The total mark for this paper is **60**
- The marks for **each** question are shown in brackets
  - *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Write your answers neatly and in good English.
- Try to answer every question.
- Check your answers if you have time at the end.

Section 1: Answer ALL questions

Q1.

(a) The table gives the masses of protein and lipid (fat) in the same volume of milk from a cow and from a human.

	Protein in g	Lipid in g
Cow	3.3	3.9
Human	1.3	4.1

Describe how you would test a sample of cow's milk and a sample of human milk to show they contain different masses of protein.

(2)

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(b) Some of the proteins in milk are antibodies.

Explain why antibodies in milk are useful for babies.

(2)

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(c) Give **two** ways that lipid in milk is used by babies.

(2)

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(d) Milk is used to make yoghurt.

(i) Name the carbohydrate in milk used to make yoghurt.

(1)

(ii) Name the bacteria added to milk to make yoghurt.

(1)

(iii) Explain why milk needs to be heated to a high temperature at the start of the process formaking yoghurt.

(2)

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(Total for question = 10 marks)

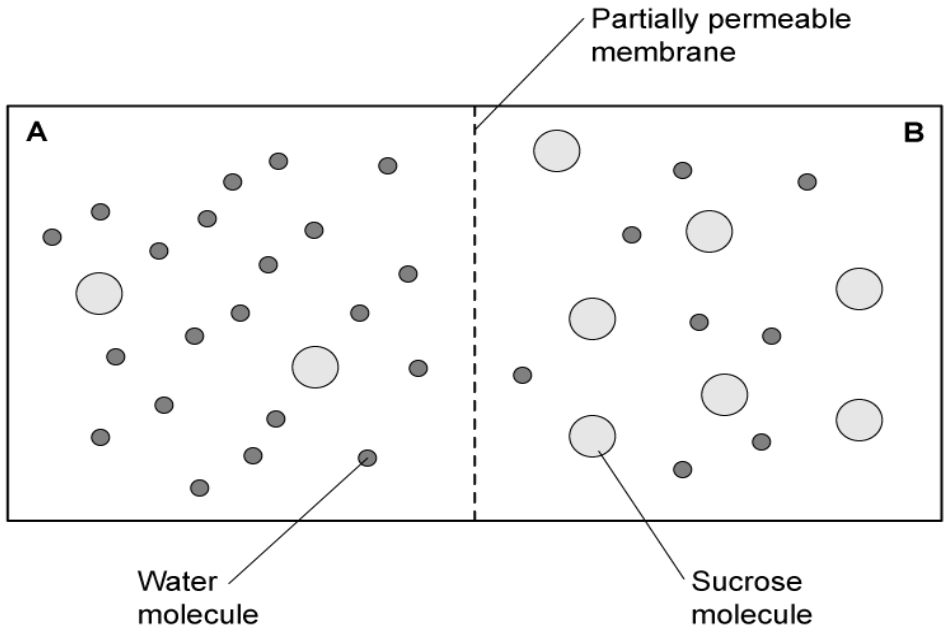
Q2.

(a) Complete each row of the table with a tick (✓) or a cross (✗) to indicate whether it is a feature of osmosis.

Feature	✓ / ✗
Involves the movement of gases	
Requires energy from respiration	
Movement occurs through a partially permeable membrane	
Particles move down a concentration gradient	

(4)

(b) Draw an arrow on the diagram to show the overall direction that the water particles will move in (net water movement).



(1)

(c) Describe an example of where diffusion of gasses is important in multicellular organisms.

(3)

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(d) Identify **one** feature of a gas exchange surface which maximises the rate of diffusion.

(1)

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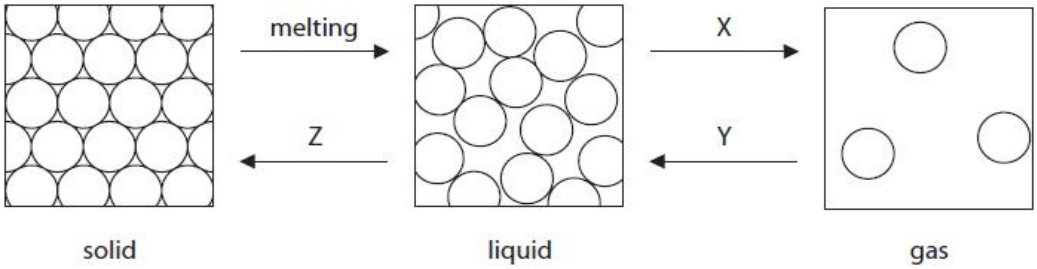
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(Total for question = 9 marks)

Section 2: Answer ALL questions

Q1.

The diagram shows how the particles are arranged in the three states of matter.



(a) Use words from the box to identify the changes of state X, Y and Z.

condensing	cooling	crystallising	diffusing
evaporating	freezing	heating	

(3)

X .....

Y .....

Z .....

(b) Describe the differences in the movement of particles in solids and gases.

(2)

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(Total for question = 5 marks)

Q2.

This question is about elements, mixtures and compounds.

(a) Which of these is the formula of a molecule of an element?

(1)

- ☒ **A** O
- ☒ **B** Cl_2
- ☒ **C** HCl
- ☒ **D** H_2O

(b) Which method can be used to separate an insoluble solid from a liquid?

(1)

- ☒ **A** crystallisation
- ☒ **B** evaporation
- ☒ **C** filtration
- ☒ **D** simple distillation

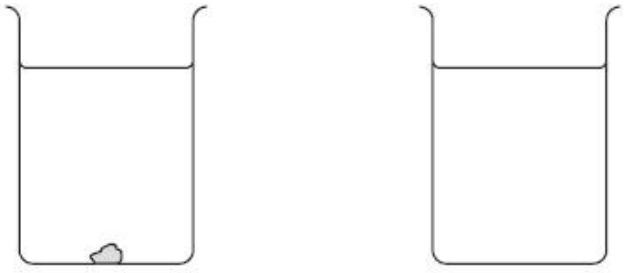
(c) Give the name of a method used to separate a mixture of liquids with different boiling points.

(1)

.....

(d) A student adds a crystal of substance X to some water in a beaker and leaves the beaker for one day.

The diagram shows the beaker immediately after adding the crystal, and after one day.



immediately after adding crystal

after one day

(i) Which equation gives the correct state symbols for a process that occurs in the beaker?

(1)

- ☒ **A** $X(s) \rightarrow X(l)$
- ☒ **B** $X(s) \rightarrow X(g)$
- ☒ **C** $X(aq) \rightarrow X(s)$
- ☒ **D** $X(s) \rightarrow X(aq)$

(ii) Which other process occurs in the beaker?

(1)

- ☒ **A** boiling
- ☒ **B** condensing
- ☒ **C** diffusion
- ☒ **D** sublimation

(Total for question = 5 marks)

Q3.
This question is about gases.

(a) The table gives information about five gases.

Name of gas	argon	carbon dioxide	hydrogen	oxygen	nitrogen
Formula of gas	Ar	CO_2	H_2	O_2	N_2
M_r of gas	40		2	32	28

Use information from the table to answer these questions.
Each gas may be used once, more than once or not at all.

(i) Give the name of the gas that is about 79 % of the atmosphere by volume.

(1)

.....

(ii) Give the name of the gas that is a compound.

(1)

.....

(iii) Give the name of the least reactive gas.

(1)

.....

(iv) Give the name of the gas that is not normally found in the atmosphere.

(1)

.....

(v) Give the name of the gas that affects global warming.

(1)

.....

(vi) Give a reason why it is not possible to give information for air in the table.

(1)

.....

.....

(b) When copper(II) carbonate is heated, the products are copper(II) oxide and carbon dioxide.

(i) Give the name for this type of reaction.

(1)

.....

(ii) Give the colour change that occurs during this reaction.

(2)

..... to .....

(iii) Give a chemical equation for this reaction.

(1)

.....

(Total for question = 10 marks)

Section 3: Answer ALL questions

Q1.

(a) Which of these objects orbits a planet?

(1)

- ☒ **A** comet
- ☒ **B** dwarf star
- ☒ **C** galaxy
- ☒ **D** moon

(b) What is the correct name for our galaxy?

(1)

- ☒ **A** Crab Nebula
- ☒ **B** Milky Way
- ☒ **C** Solar System
- ☒ **D** Universe

(c) Which of these objects has the largest mass?

(1)

- ☒ **A** artificial satellite
- ☒ **B** comet
- ☒ **C** Earth
- ☒ **D** Sun

(d) Which of these stars is the coolest?

(1)

- ☒ **A** blue star
- ☒ **B** orange star
- ☒ **C** red star
- ☒ **D** yellow star

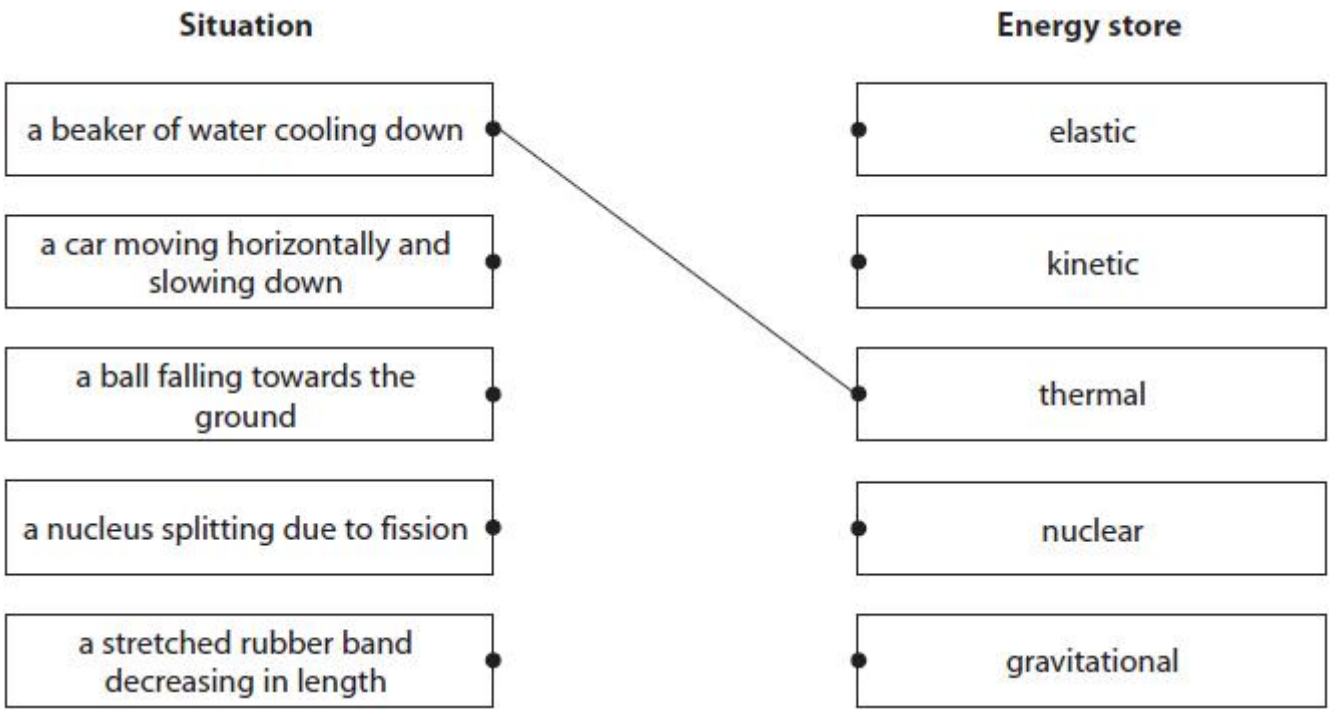
(Total for question = 4 marks)

Q2.

(a) The boxes give some situations and some energy stores.

Draw one straight line from each situation to the energy store that decreases for that situation.
The first one has been done for you.

(4)



(b) Energy is transferred when a filament lamp is connected to a battery.

(i) Which method of energy transfer takes place between the battery and the lamp?

(1)

- ☒ **A** electrical
- ☒ **B** heating
- ☒ **C** mechanical
- ☒ **D** radiation

(ii) Which method of energy transfer takes place between the lamp and the surroundings?

(1)

- ☒ **A** electrical
- ☒ **B** light radiation
- ☒ **C** mechanical
- ☒ **D** sound radiation

(Total for question = 6 marks)

Q3.

This question is about energy resources.

(a) The table lists some methods of generating electricity using energy resources.

Place ticks (✓) in the table to show if each method uses a renewable energy resource. One has been done for you.

(3)

Method of generating electricity	Uses a renewable energy resource
coal power station	
diesel generator	
geothermal power station	
hydroelectric power station	
natural gas turbine	
nuclear power station	
solar cell	✓
wind turbine	

(b) Solar cells can be used to generate electricity.

(i) How is energy transferred from the Sun to a solar cell?

(1)

- ☒ **A** by heating
- ☒ **B** by radiation
- ☒ **C** electrically
- ☒ **D** mechanically

(ii) State one disadvantage of using solar cells to generate electricity.

(1)

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(Total for question = 5 marks)

Q4.

Wind speed affects the wavelength of water waves on the surface of the sea.

The table shows the wavelength of waves on the surface of the sea for different wind speeds.

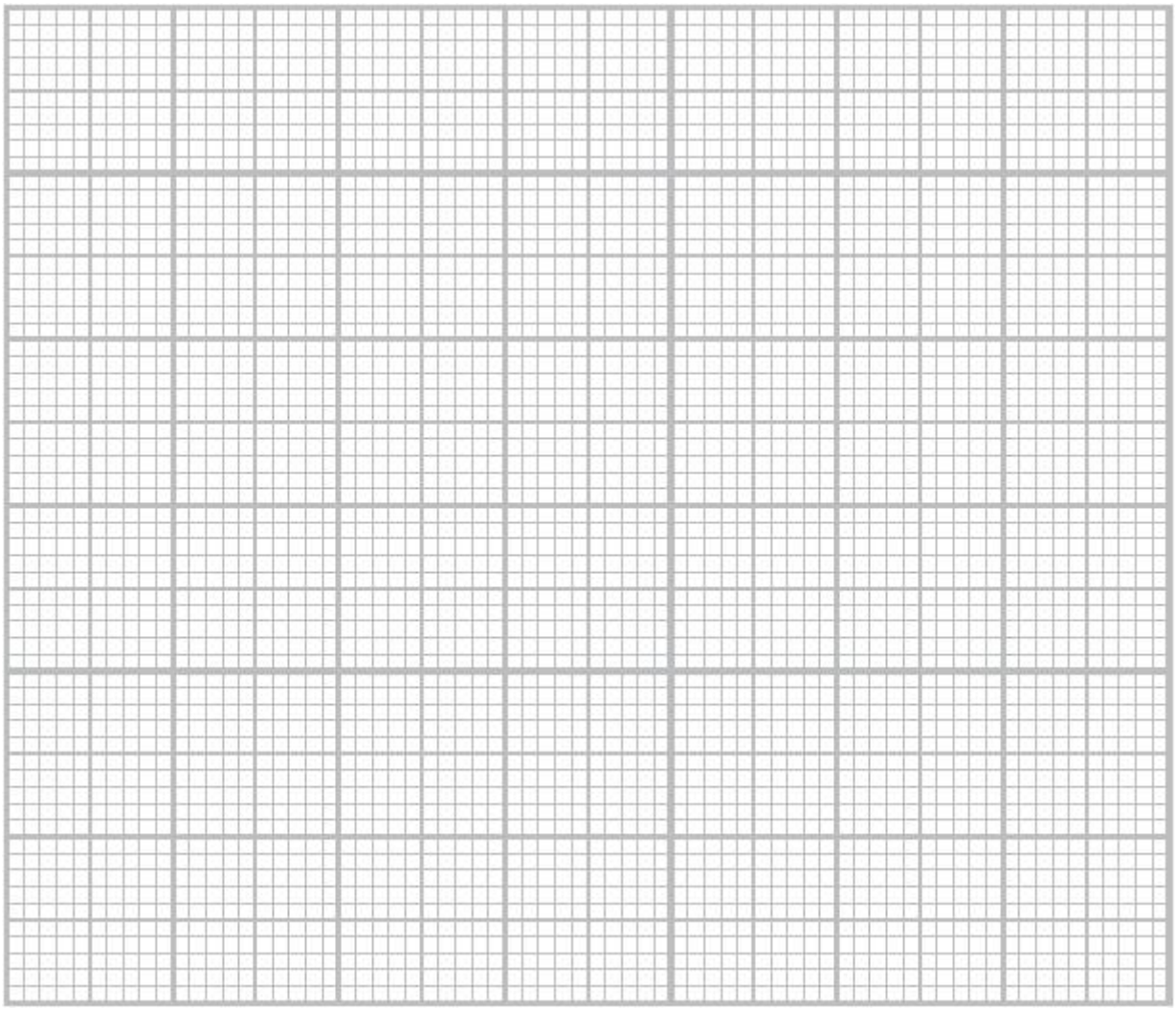
Wind speed in m / s	Wavelength of waves on the surface of the sea in m
0	0
5	12
10	49
15	110
20	196
25	306
30	441
35	600

(a) Plot a graph of this data on the graph provided in the next page.

(3)

(b) Draw the curve of best fit.

(1)



(c) Describe the relationship between wind speed and the wavelength of waves on the surface of the sea.

(2)

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(Total for question = 6 marks)

***** End of Paper *****