New Document 1

Name: _____

Class: _____

Date: _____

Time: **36 minutes**

Marks: **35 marks**

Comments:

Q1.

This question is about gases in the Earth's atmosphere.

(a) The amount of carbon dioxide in the Earth's atmosphere decreased during the first billion years of the Earth's existence.

Complete the sentences. Use words from the box.

carbonates	dissolved	evaporated	melted	nitrates	sulfates

The amount of carbon dioxide in the Earth's atmosphere decreased because

the carbon dioxide_____ in the oceans.

Sediments were formed when _____ were produced.

Algae and plants use carbon dioxide and water to produce oxygen.

(2)

(b) What is the name of this process?

Tick **one** box.

Carbon capture ☐

Combustion ☐

Photosynthesis ☐

Polymerisation ☐

(1)

(c) Complete the word equation for this process.

carbon dioxide + _____ → glucose + _____

(1)

(d) Draw **one** line from each gas to the approximate percentage of the gas in the Earth's atmosphere today.

Gas	Approximate percentage of gas in the Earth's atmosphere today
	<1
	5

Carbon dioxide	10
Nitrogen	20
	50
Oxygen	80
	>90

(3)

(e) Carbon dioxide is a greenhouse gas.

Why does increasing the amount of carbon dioxide change the global climate?

_____

(1)

(f) How can countries reduce carbon dioxide emissions?

Tick **one** box.

only burn methane	☐
use renewable energy supplies	☐
use waste plastic bags as fuel	☐

(1)

(g) Give **one** reason why it is difficult for countries to reduce emissions of carbon dioxide.

_____

_____

(1)

(Total 10 marks)

Q2.

Some theories suggest that the Earth's early atmosphere was the same as Mars' atmosphere today.

The table below shows the percentage of four gases in the atmosphere of Mars today and the atmosphere of Earth today.

Gases	The atmosphere of	
	Mars today	**Earth today**
Carbon dioxide	95.00%	0.04%
Nitrogen	3.50%	78.00%
Argon	1.00%	0.96%
Oxygen	0.50%	21.00%

(a) Which **one** of the gases in the table is a noble gas?

_____

(1)

(b) Draw a ring around the correct answer to complete each sentence.

(i) Noble gases are in Group

0

1

7

(1)

(ii) Noble gases are

slightly reactive.

unreactive.

very reactive.

(1)

(c) The percentage of carbon dioxide in the Earth's early atmosphere was 95.00%. It is 0.04% in the Earth's atmosphere today.

(i) Calculate the decrease in the percentage of carbon dioxide in the Earth's atmosphere.

_____

_____

Decrease in percentage = _____%

(1)

(ii) Give **two** reasons for this decrease.

_____

_____

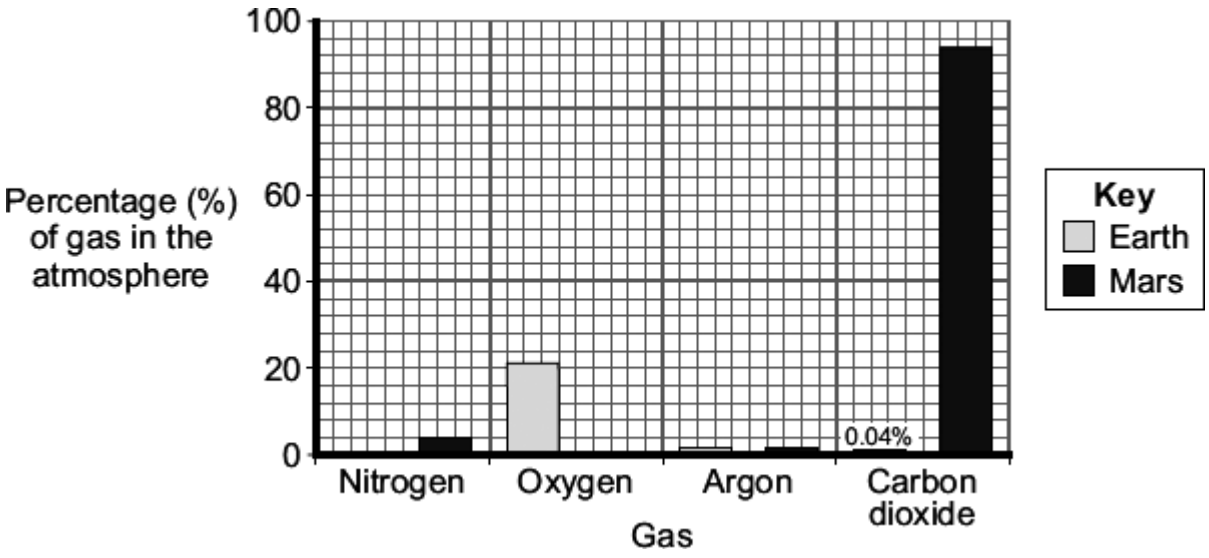
_____

_____

(2)
(Total 6 marks)

Q3.

The bar chart shows some of the gases in the atmospheres of Earth today and Mars today.



(a) Complete the bar chart to show the percentage of nitrogen in the Earth's atmosphere today.

(1)

(b) Some scientists suggest that the Earth's early atmosphere was like the atmosphere of Mars today.

(i) There is **not** much oxygen in the atmosphere of Mars.

Suggest why.

_____

_____

(1)

(ii) The percentage of argon in the Earth's atmosphere today is the same as it was in the Earth's early atmosphere.

Suggest why.

_____

_____

(1)

(c) Compared with the percentage of carbon dioxide in the Earth's early atmosphere there is **not** much carbon dioxide in the Earth's atmosphere today.

Give **one** reason for this change.

_____

(1)

(d) Draw a ring around the correct answer to complete the sentence.

Some theories suggest that the Earth's early atmosphere was

made by

burning fossil fuels.
the formation of oceans.
the eruption of volcanoes.

(1)

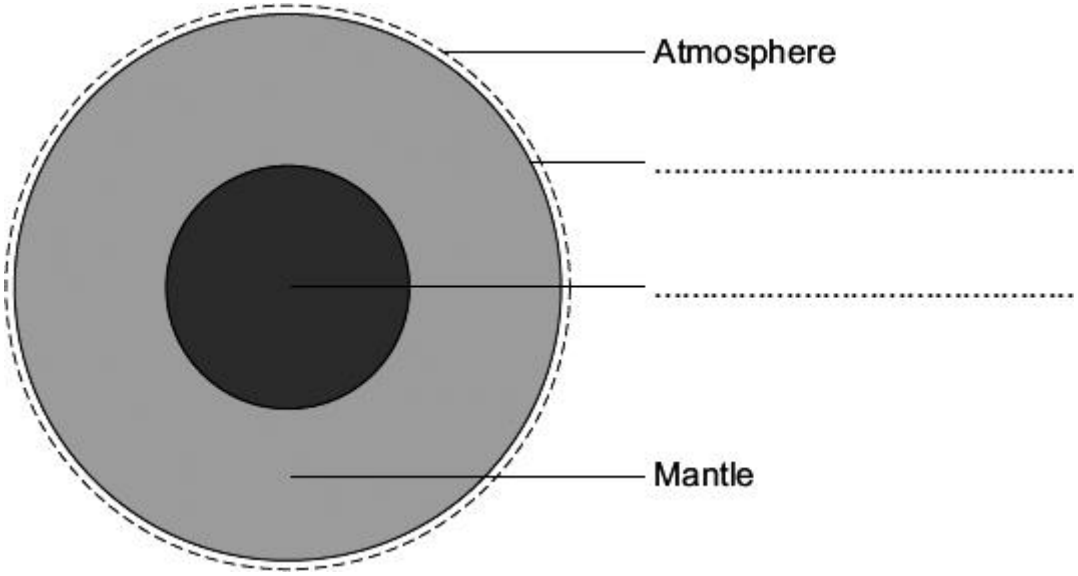
(Total 5 marks)

Q4.

The Earth has a layered structure and is surrounded by an atmosphere.

(a) The diagram shows the layers of the Earth.

Complete the labels on the diagram.

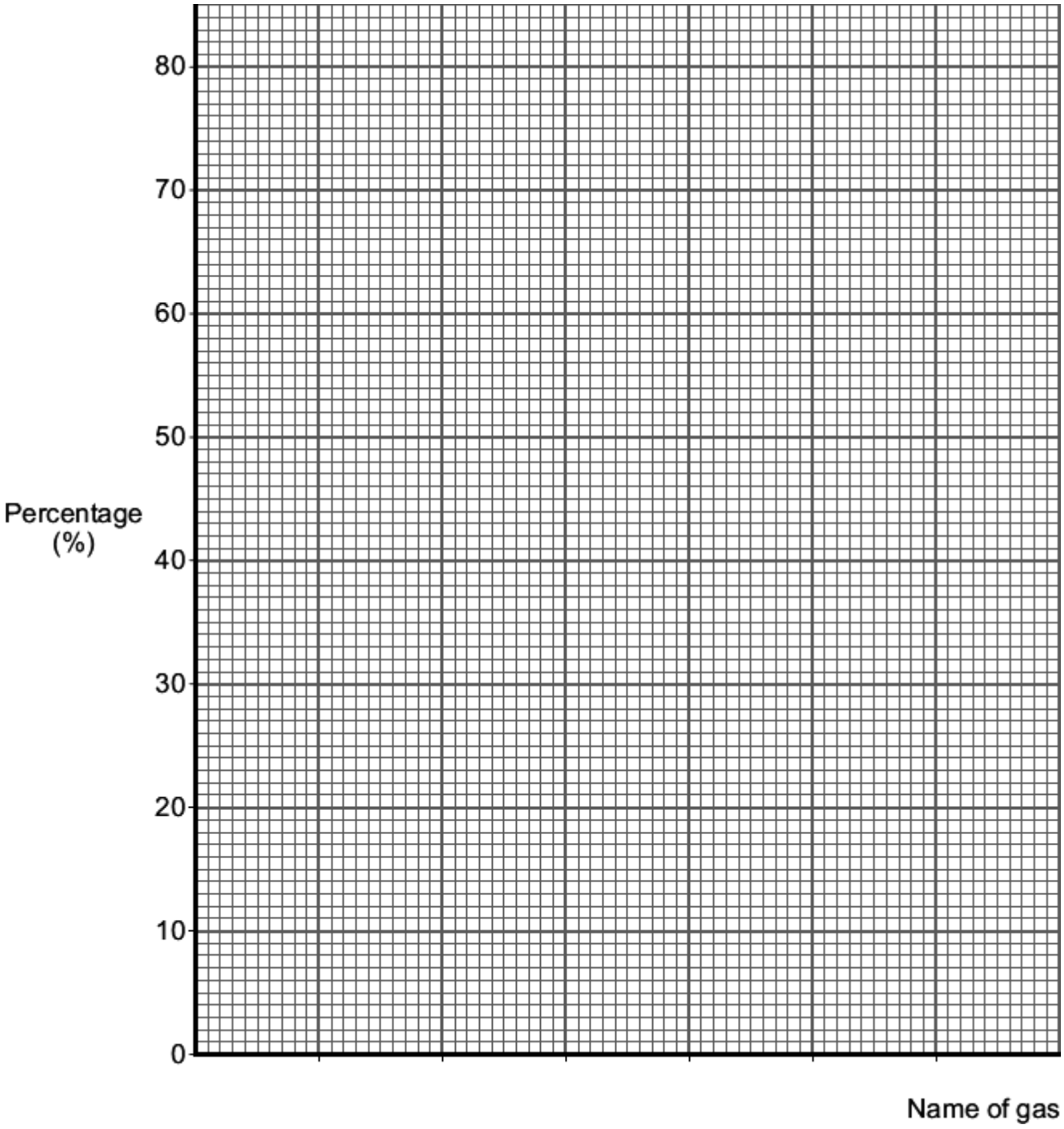


(2)

(b) The data in the table shows the percentages of the gases in the Earth's atmosphere.

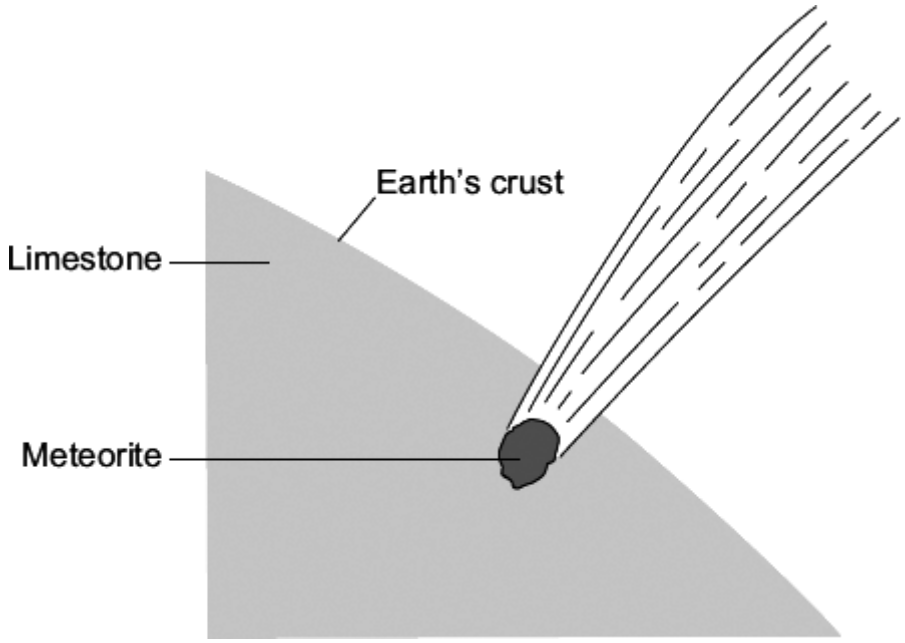
Name of gas	Percentage (%) of gas
Nitrogen	78
Oxygen	21
Other gases	1

Present the data in the table on the grid below.



(3)

(c) Millions of years ago a large meteorite hit the Earth.
The meteorite heated limestone in the Earth's crust to a very high temperature.
The heat caused calcium carbonate in the limestone to release large amounts of carbon dioxide.



Draw a ring round the correct answer to complete each sentence.

(i) Carbon dioxide was released because the calcium carbonate was

decomposed.
evaporated.
reduced.

(1)

(ii) More carbon dioxide in the Earth's atmosphere causes

acid rain.
global dimming.
global warming.

(1)

(Total 7 marks)

Q5.

Billions of years ago, the Earth's early atmosphere was probably like the atmosphere of Venus today.

The table shows a comparison of the atmospheres of the Earth and Venus today.

	Percentage composition of atmosphere	
Name of gas	**Earth today**	**Venus today**
Nitrogen	78	3.5
Oxygen	21	a trace
Argon	0.97	a trace
Carbon dioxide	0.03	96.5

Average surface temperature	20 ºC	460 ºC

(a) Use the names of gases from the table to complete the sentences.

(i) In the Earth's atmosphere today, the main gas is _____ .

(1)

(ii) In the Earth's atmosphere billions of years ago, the main gas was

_____. .

(1)

(b) (i) Scientists do **not** know the accurate composition of the Earth's early atmosphere.
Suggest why.

_____

_____

(1)

(ii) Use information from the table to answer this question.

Water vapour is present in the atmospheres of the Earth and Venus today.
The Earth's surface is mainly covered by water.

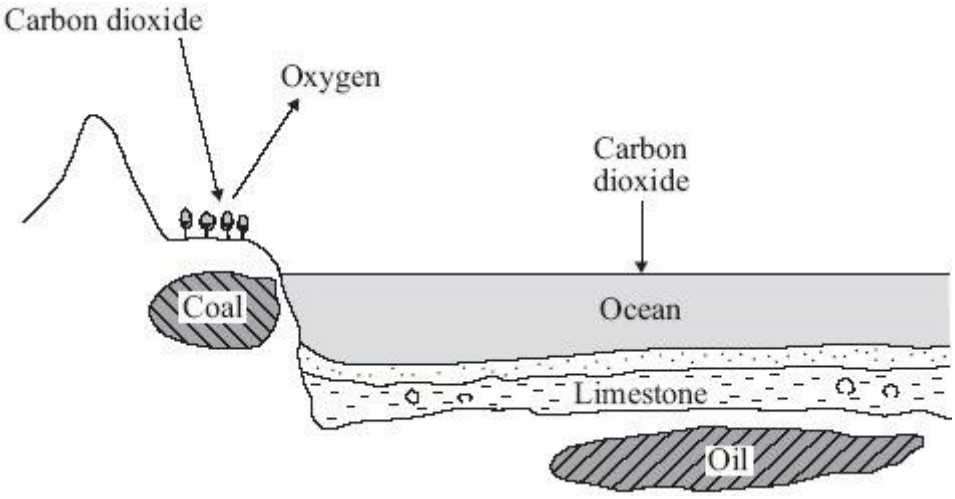
Suggest why there is no water on the surface of Venus.

_____

_____

(1)

(c) The diagram shows how carbon dioxide is removed from the Earth's atmosphere.



Describe what happened to the carbon dioxide in the Earth's early atmosphere.
Use the diagram to help you.

_____

(3)

(Total 7 marks)

Mark schemes

Q1.

(a) dissolved

in this order

1

carbonates

1

(b) Photosynthesis

1

(c) water

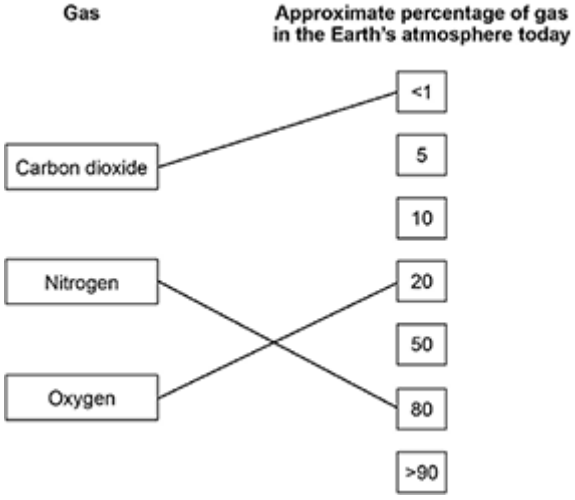
In this order

oxygen

both needed for the mark

1

(d)



Extra lines from Gas negate the mark

3

(e) increases global temperatures

1

(f) use renewable energy supplies

1

(g) correct reason, eg:

- renewable technology underdeveloped
- disagreement between countries

1

[10]

Q2.

(a) argon / Ar

1

(b) (i) 0

1

(ii) unreactive

1

(c) (i) 94.96(%)

1

(ii) any **two** from:

- plants or photosynthesis
- absorbed in oceans / *seas*

  *allow oceans store **or** take in **or** dissolve carbon dioxide*
- locked up in (sedimentary) rocks
- locked up in fossil fuels

2

[6]

Q3.

(a) bar drawn correctly 78 – 80 (%)

1

(b) (i) (Mars has) no (green / living) plants / trees

1

(ii) (argon) is unreactive / inert

accept argon is a noble gas

ignore it is in Group 0

1

(c) (the amount of carbon dioxide has decreased because it has been) absorbed / used by (green / living) plants / trees **or** used for photosynthesis

accept dissolved / absorbed by oceans or locked up in fossil fuels / carbonate rocks

1

(d) the eruption of volcanoes

1

[5]

Q4.

(a) crust

ignore Earth's

1

core

ignore inner and/or outer

1

(b) bar chart

1

all heights are correct

accept correctly plotted points

1

all labels are correct for nitrogen, oxygen and other / argon

1

(c) (i) decomposed

1

(ii) global warming

1

[7]

Q5.

(a) (i) nitrogen / N_2

1

(ii) carbon dioxide / CO_2

1

(b) (i) humans / scientists had not evolved

accept it was billions / millions of years ago

allow too long ago

1

(ii) temperature is above 100°C **or** any water would evaporate / boil

accept Venus is too hot

1

(c) any **three** from:

- used by <u>plants</u>
- used for <u>photosynthesis</u>

  *accept <u>plants take in carbon dioxide and give out oxygen</u> for the first two bullet points ie **2** marks*
- <u>dissolves</u> in oceans / seas

  allow absorbs into oceans / seas
- used to form the shells / skeletons of marine organisms
- <u>locked up</u> as limestone / carbonates
- <u>locked up</u> as fossil fuels / oil / coal

3

[7]