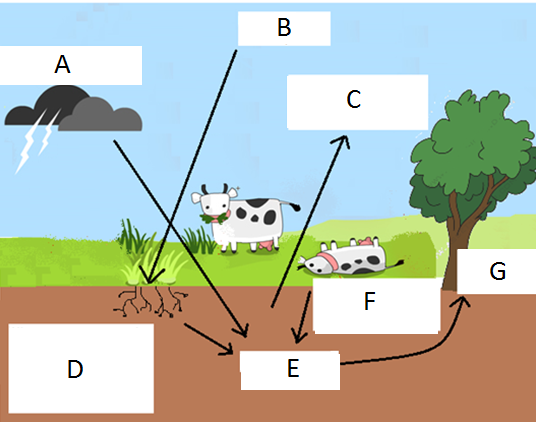
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| --- | --- |
|  | **SCIENCE : YEAR 10 : TEST**  **GLOBAL SYSTEMS** |

**NAME**: **MARKS**: /**62**

**TIME**: **52** minutes

**SECTION A: MULTIPLE CHOICE (11 marks)**

Questions 1-3 are based on the diagram of the nitrogen cycle on the right.



**1**. Label ‘A’ shows lightning:

(a) converting nitrates to nitrogen gas.

(b) converting nitrogen gas to nitrates.

(c) denitrifying nitrates to nitrogen gas.

(d) warming the air.

**2**. Label ‘B’ refers to:

(a) nitrogen gas in the soil.

(b) nitrates in the soil.

(c) nitrates in the atmosphere.

(d) nitrogen gas in the atmosphere.

**3**. Label ‘F’ shows:

(a) decomposers rotting a dead animal to return nitrates to the soil.

(b) nitrogen fixing bacteria converting nitrogen gas back to nitrates.

(c) nitrogen fixing bacteria converting nitrates in soil back to nitrogen gas.

(d) denitrifying bacteria converting nitrates in soil back to nitrogen gas.

**4**. The process where plants convert atmospheric carbon dioxide and water from the soil into in simple sugars (glucose) is called:

(a) respiration.

(b) transpiration.

(c) photosynthesis.

(d) transduction.

**5**. Legume plants have:

(a) root nodules for converting nitrogen gas to nitrates.

(b) root hairs that convert atmospheric carbon and water from the soil into in simple sugars.

(c) denitrifying bacteria in root nodules converting nitrates to nitrogen gas.

(d) nitrogen fixing bacteria in root nodules converting nitrates to nitrogen gas.

**6**. Identify the best description of what global warming is.

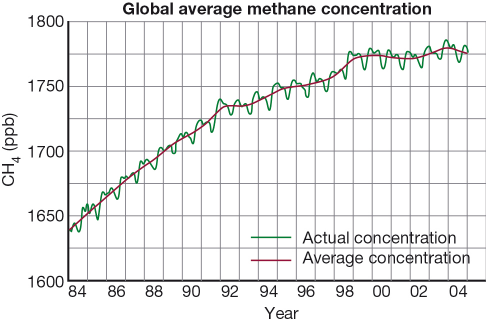
(a) periods of global warming occur between periods of glaciation

(b) greenhouse gases in the atmosphere cause global warming

(c) global warming began after the Industrial Revolution

(d) during periods of global warming sea levels fall exposing more land

**7**. Identify the statement that is supported by the data represented in the graph.

****

(a) The most rapid increase in methane levels in the atmosphere was from 1992 to 1998.

(b) Methane levels increased by 20% from 1984 to 2004.

(c) The concentration of methane in the atmosphere decreased from 1997 to 2004.

(d) There is an annual variation in methane concentration that follows a similar pattern each year.

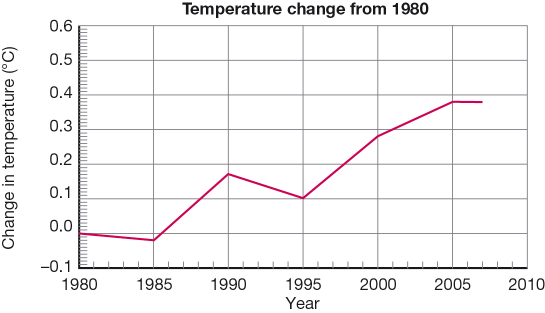
1. **8**. Using the information in the graph below, calculate the average yearly increase in temperature from the year 1980 to 2007.

(a) 0.38°C

(b) 0.29°C

(c) 0.12°C

(d) 0.014°C



1. **9**. Using the graph in question 8, deduce the period when the temperature was increasing most rapidly.

(a) 1980 to 1985

(b) 1985 to 1990

(c) 1995 to 2000

(d) 2000 to 2005

**10**. Which statement does NOT describe the Southern Oscillation?

(a) During El Niño events the Southern Oscillation Index (SOI) is strongly negative. During La Niña the SOI is strongly positive.

(b) The Southern Oscillation has most effect on weather in central and southern Australia.

(c) The SOI is a measure of the atmospheric and ocean conditions across the Pacific Ocean.

(d) Where there is no El Niño or La Niña winds blow from the western Pacific Ocean to the east bringing average rainfall to Australia.

**11**. Identify Earth’s largest and oldest long-term store of carbon.

(a) rainforest trees

(b) calcium carbonate

(c) fossil fuels

(d) carbon dioxide

**SECTION B: SHORT ANSWER (51 marks)**

**1.** Explain the difference between weather and climate. (2 marks)

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**2.** Explain why plants can suffer from a lack of nitrogen despite being surrounded by air that is 78% nitrogen. (2 marks)

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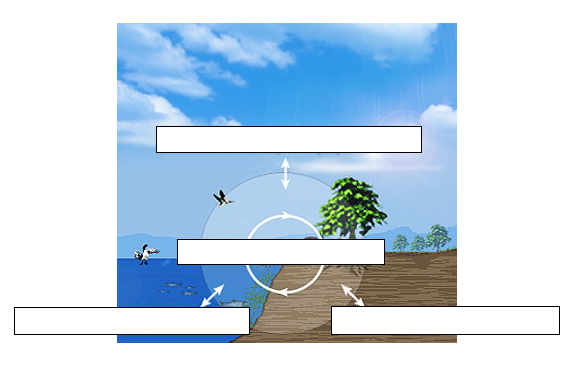
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**3.** Label the different spheres in the diagram below. (2 marks)

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**Sea**

**Land**

**4.** Explain why those areas of the Earth’s surface covered in ice do not warm as fast as those areas covered by dark forests? (4 marks)

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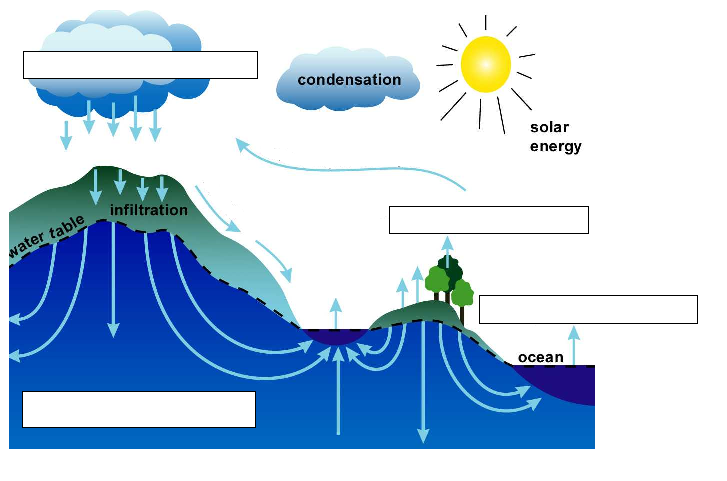
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**5.** One suggested way of reducing the impact of carbon emissions is to plant more trees. Explain why this would be a useful strategy. (2 marks)

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**6.** Label the diagram of the water cycle shown below. (4 marks)

**7.** Name four (4) of the main greenhouse gases. (4 marks)

i)

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**8.** Identify two (2) general ways in which greenhouse gases can be reduced.

(General methods only, not specific methods like planting trees) (2 marks)

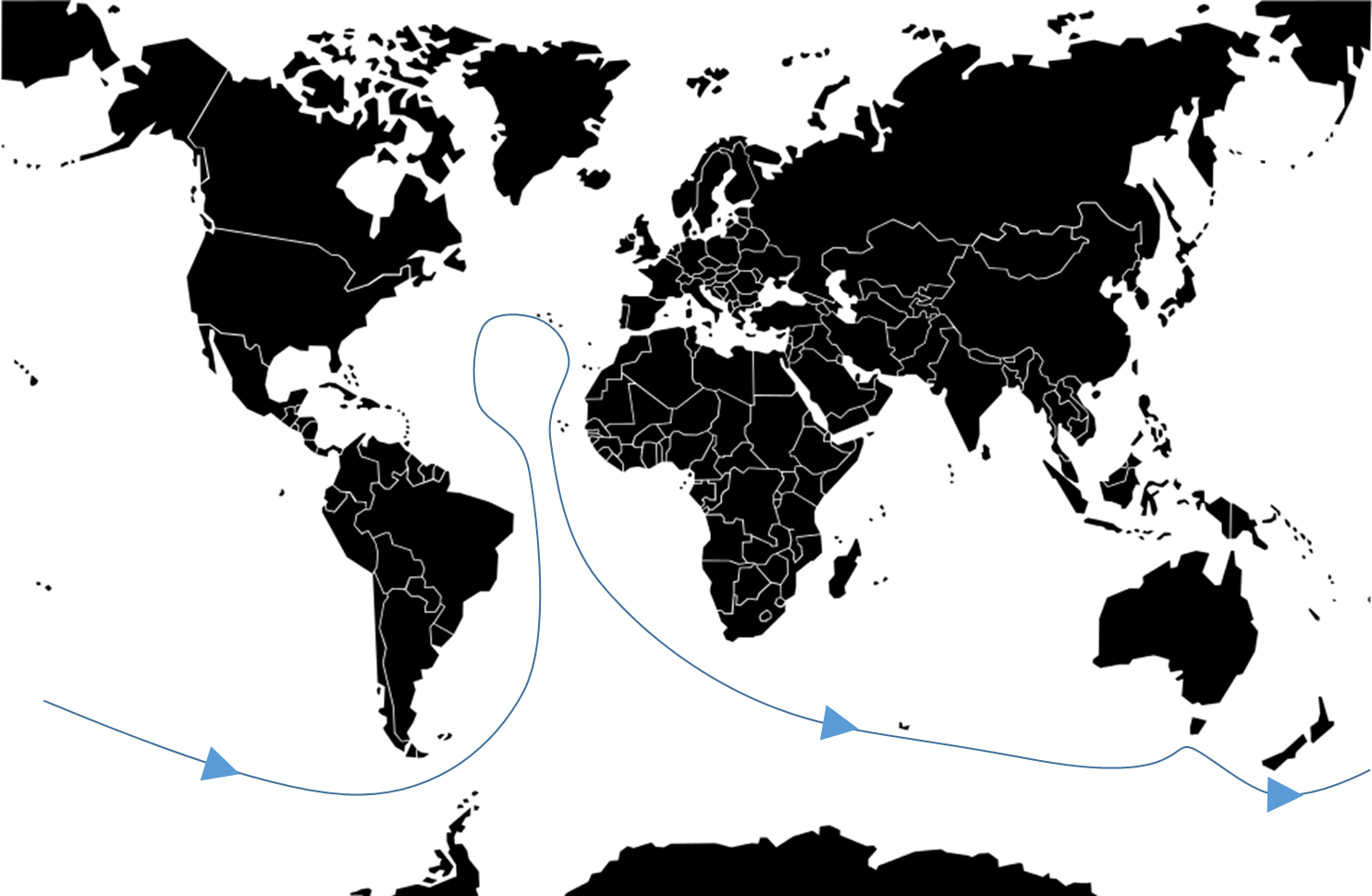
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**9**. Round-the-world sailors usually follow the route shown in the Figure below. The loop in the Atlantic Ocean is to make the total distance equal to sailing around the equator, which is obviously impossible because of the land. **Propose** why sailors from west to east and not the other way around. (2 marks)

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**10**. Outline the relationship between interglacials and global warming. (2 marks)

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**11.** Match the terms to their definitions by writing the number of the correct definition in the box.(10 marks)

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| --- | --- | --- | --- |
|  | **TERM** |  | **DEFINITION** |
|  | Enhanced greenhouse effect | 1. | All the liquid water on the Earth’s surface. |
|  | Biosphere | 2. | The warming of the Earth caused by greenhouse gases. |
|  | Hydrosphere | 3. | Land masses on Earth. |
|  | Greenhouse effect | 4. | The preserved remains of once-living organisms. |
|  | Atmosphere | 5. | The layers of gases surrounding the planet. |
|  | Fossils | 6. | A time when the average world temperature is increasing. |
|  | Global warming | 7. | Increase in the natural greenhouse effect caused by human activity. |
|  | Fossil fuels | 8. | All living things on Earth. |
|  | Lithosphere | 9. | The variety of ecosystems in the biosphere, the variety of species within those ecosystems and the genetic variation within those species. |
|  | Biodiversity | 10. | Fuels that contain the carbon of plants and animals that died and were preserved millions of years ago. |

**12**. List three (3) factors that affect the world’s climate. (3 marks)

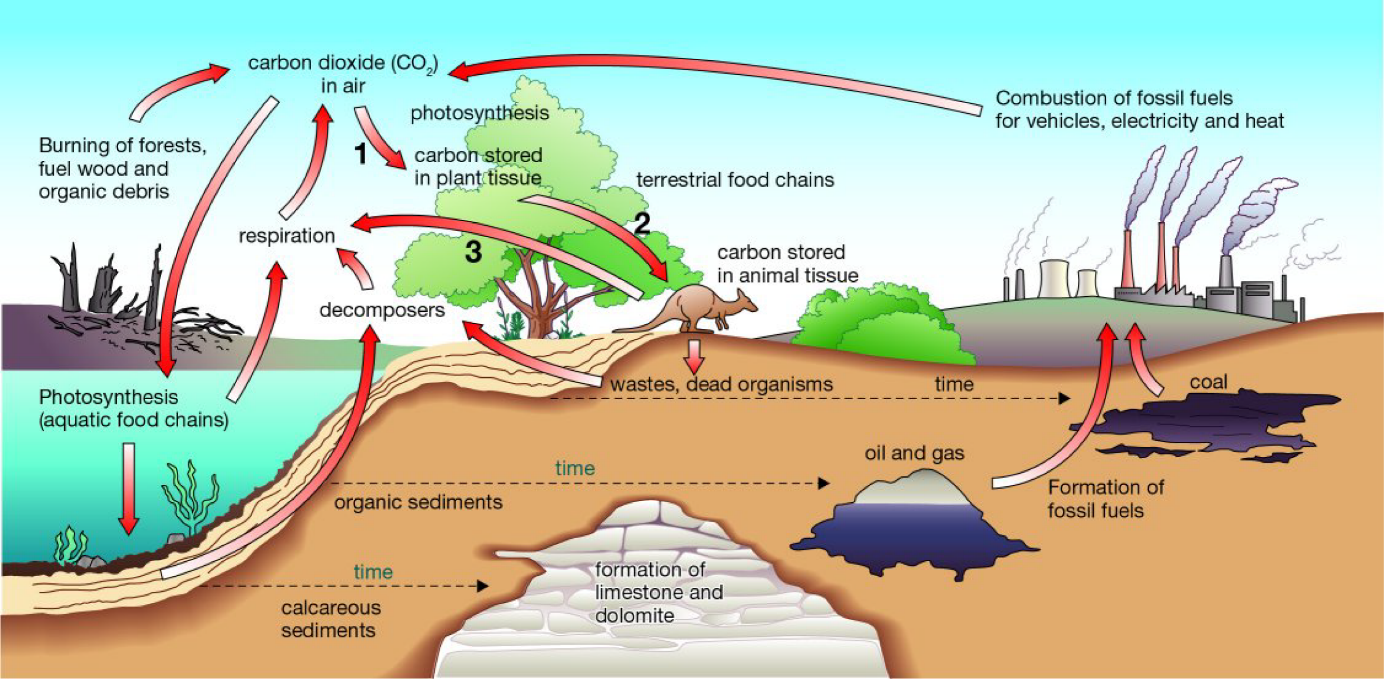
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**13**. Refer to the **Figure** below. The diagram represents part of the carbon cycle. (3, 2 = 5 marks)



**a Construct** a statement for each of the numbered arrows, describing what happens at that step.

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**b Explain** why the recycling of materials is important to the continued functioning of ecosystems.

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**14**. Human activities have added extra carbon dioxide to the atmosphere, putting the carbon cycle out of balance. Propose four (4) likely effects from a continued increase in levels of atmospheric carbon dioxide. (4 marks)

Adding CO2 to the atmosphere is likely to cause increased average world temperatures. Possible flow-on effects include:

i)

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ii)

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iii)

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iv)

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1. **15. Explain** how each of the following can be used as evidence of climate past change. (3 marks)

**a**  ice cores

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**b** sedimentary rocks

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**c**  glaciers

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