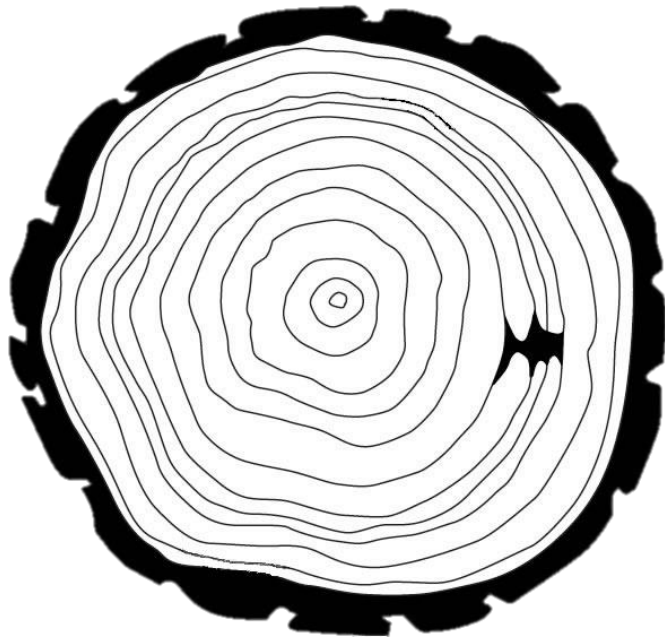## G10 Science: Class 14 Homework

1. Explain how proxy records give evidence of past climate changes. Use two examples of the types of records and what information they provide. **[3 marks]**

2. Label the following features on the tree rings diagram below: **[5 marks]**
   a. Dry season
   b. Rainy Season
   c. First year growth
   d. Scar from forest fire
   e. How old is this tree?

3. People who live in valleys below melting glaciers have more drinking water available than 30 years ago. In the future, however they will have less drinking water available than 30 years ago. Explain why this may happen. **[2 marks]**

4. If you are faced with a person that claims that climate change is not occurring, how would you respond? Provide three reasons for your response. **[3 marks]**

5. a) Calculate the percent increase for carbon dioxide, methane and nitrous oxide using the table below: **[3 marks]**

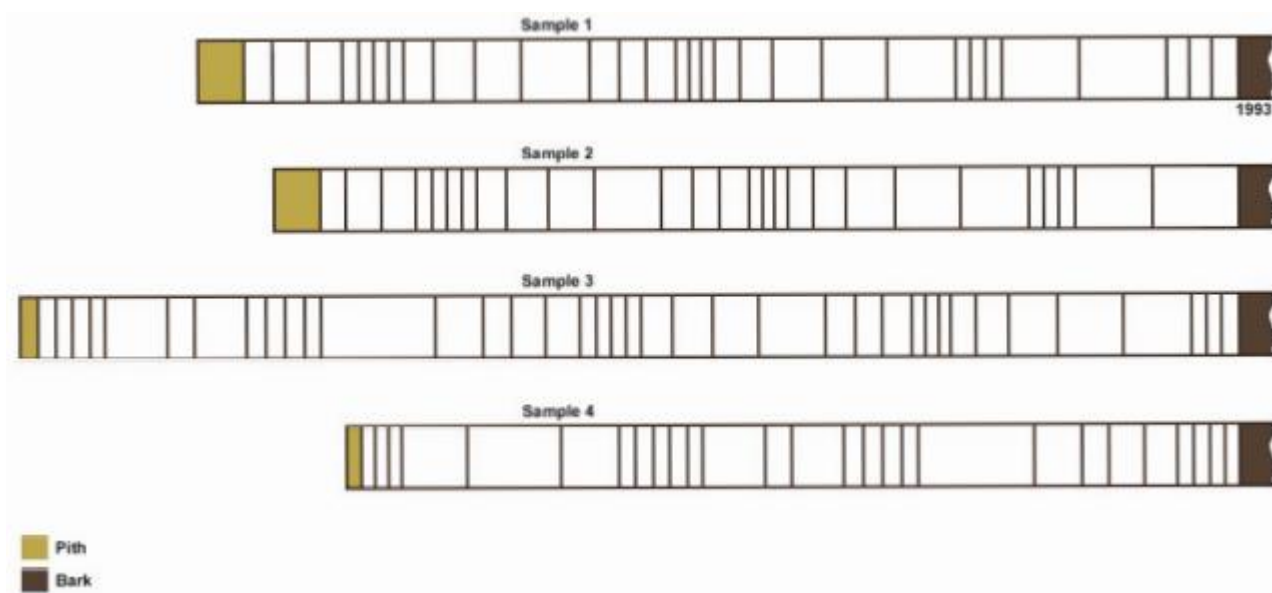**Table 1** Concentrations and Lifetimes of Atmospheric Greenhouse Gases

Greenhouse gas	Concentration in the atmosphere		Approximate atmospheric lifetime
	Pre-industrial level	2008 level	
carbon dioxide	280 ppm	384 ppm	100 to 1 000 years
methane	0.700 ppm (700 ppb)	1.785 ppm (1785 ppb)	12 years
nitrous oxide	0.270 ppm (270 ppb)	0.321 ppm (321 ppb)	114 years
CFC-11	trace amounts	0.000251 ppm (251 ppt)	45 years
CFC-12	trace amounts	0.000525 ppm (525 ppt)	100 years

Data from *IPCC Climate Change 2007: The Physical Science Basis* and *The NOAA Annual Greenhouse Gas Index*

b) Based on your calculations, should scientist be concerned about the gases with the highest percent increase? Why or why not? **[1 mark]**

6. Some people say that Canada could benefit from a warming climate. Give 3 reasons why this might be the case. **[3 marks]**

7. A warmer climate may lower lake levels, which would reduce the capacity to generate hydroelectricity, which would increase electricity production from fossil fuels, which would lead to a warmer climate. **[3 marks]**

    a) Is this a negative or positive feedback loop?

    b) What can the Ontario government do to break this loop?

8. Predict how climate change might impact each of the following continents. Include at least two impacts for each. **[6 marks]**

    a) North America

    b) Africa

    c) Australia

9. Explain how a tree on your lawn could be a: **[2 marks]**

    a) Carbon Sink

    b) Carbon Source

10. Using the tree core samples below, answer the following questions. The pith (central layer) and bark (outermost layer) are not counted in determining the age of the sample. The youngest ring is closest to the bark and the oldest ring is closest to the pith.

Sample 1

1993

Sample 2

Sample 3

Sample 4

Pith
Bark

a) Fill in the following information for each sample: **[12 marks]**

Sample	Age of Tree	Year Cut or Cored	Year Growth Began
1			
2			
3			
4			

b) What type of climate do wide rings indicate? **[1 mark]**

c) What type of climate do narrow rings indicate? **[1 mark]**

d) Using these core samples, what is the total length of time that we have climate data for? **[1 mark]**