Name: **KEY**

Science 9 Unit C Practice Test

1. Organic compounds are those that contain both __i__ and __ii__.

The sentence above is completed by the information in row

Row	i	ii
A	carbon	hydrogen
B	carbon	oxygen
C	macronutrients	micronutrients
D	macronutrients	carbohydrates

2. The macronutrients required by the human body are
   A. Starch, Proteins, Vitamins
   B. Carbohydrates, Proteins, Lipids
   C. Lipids, Oxygen, Water
   D. Carbohydrates, Proteins, Vitamins

3. An example of a micronutrient required by the human body is
   A. Carbohydrates
   B. Water
   C. Calcium
   D. Oxygen

Use the following information to answer the next question

I. C_3H_8
II. CO_2
III. Oxygen
IV. Carbohydrates

4. The **inorganic** substance(s) is/are:
   A. I and IV
   B. II and III
   C. II only
   D. III only

5. Which of the following substances is organic and can be produced by plants?
   A. H_2O (water, a liquid)
   B. O_2 (oxygen, a gas)
   C. $C_{12}H_{22}O_{11}$ (sucrose, a type of sugar)
   D. CO_2 (carbon dioxide, a gas)

6. Which of the following foods is a source of healthy proteins?

    A. Seeds

    B. Whole grain bread

    C. Fruit

    D. Turkey

Use the following information to answer the next question

Four Students' Statements About the pH Scale	
Student I	A substance with pH 3 is a base
Student II	The pH of bases is always higher than the pH of acids
Student III	An exactly neutral substance has a pH of 7
Student IV	Strong acids have the highest pH value

7. Which two students provided statements that are correct?

    A. Students I and II

    B. Students II and III

   C. Students III and IV

    D. Students I and IV

8. Bromothymol blue is a pH indicator that turns blue in bases, yellow in acids, and is green in neutral substances. For which two substances will bromothymol blue be yellow?

    A. baking soda and dish soap

    B. Water and milk

    C. blood and dish soap

    D. lemon juice and carbon dioxide

9. Drain cleaner is a base. Which of the following litmus test results would you expect?

	Red Litmus Paper Results	Blue Litmus Paper Results
A.	stays red	stays blue
B.	stays red	turns red
C.	turns blue	stays blue
D.	turns blue	turns red

Changing pH of a Solution

Volume of solution B added to solution A (mL)
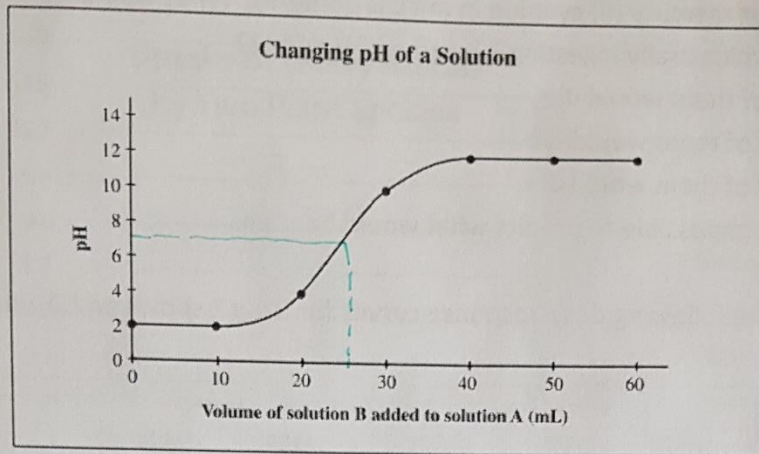
10. The graph shown above can be best described as

    A. An acidic solution becoming basic

    B. A basic solution becoming acidic

    C. A solution becoming neutral

    D. None of the above

11. The volume of solution B required to neutralize solution A is

    A. 15 mL

    B. 25 mL

    C. 35 mL

   **D.** 45 mL

Algae growth typically increases in polluted lakes.

12. The chemicals that are more likely responsible for increases in algae growth in lakes are

    A. Oxygen and carbon dioxide

    B. Nitrates and carbon dioxide

    C. Oxygen and phosphates

    D. Nitrates and phosphates

13. The LD50 for mercury (II) cyanide in mice is 33mg/kg. What would be the result of 200 laboratory mice orally ingesting 33mg/kg of Hg(CN)2?

    A. 33 of them would die

    B. 100 of them would die

    C. 200 of them would die

    D. It is impossible to predict what would happen.

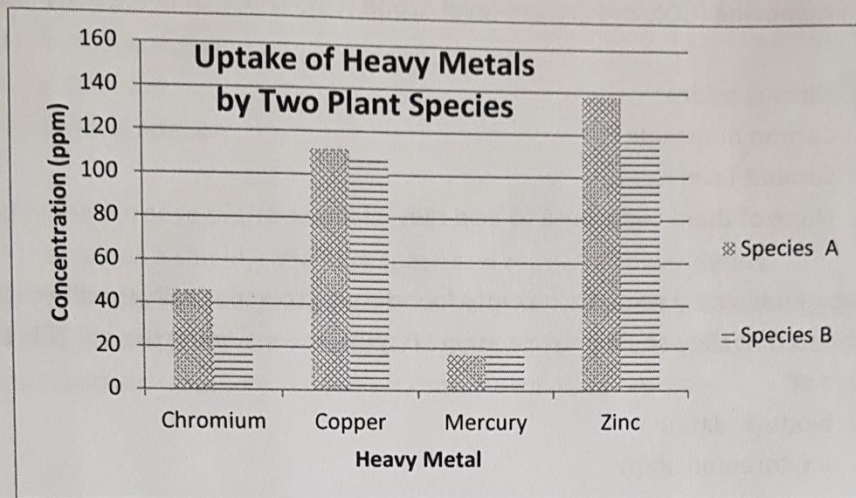**14.** Which of the following dose-response curves for Drug Z shows an LD_{50} of 70mg/kg?
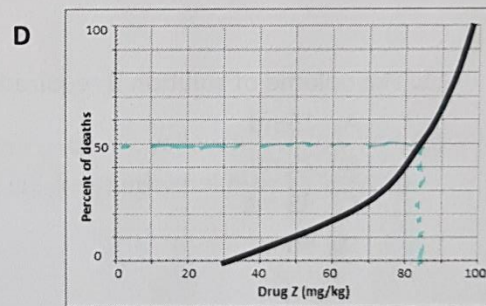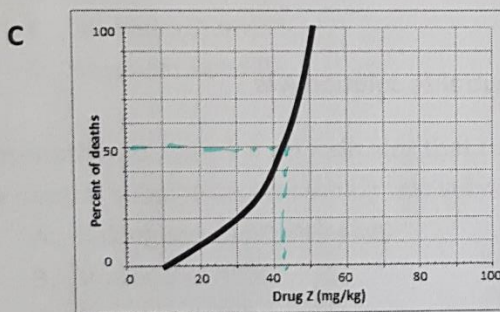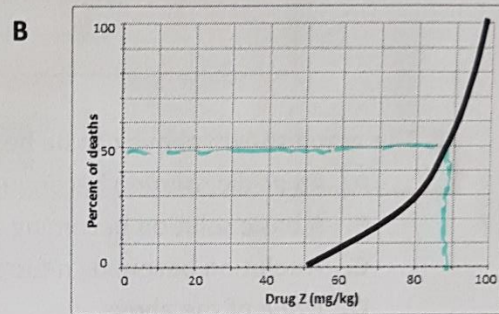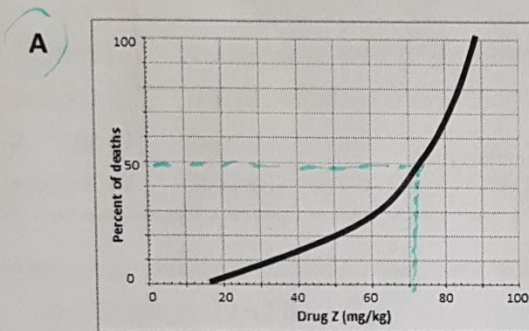
15. Phosphorus and nitrogen rich fertilizers leaching into the water system from nearby farms can have a long term effect on the health of an aquatic ecosystem because

    A. the chemicals are poisonous and will kill the pond plants and animals.

    B. the chemicals cause plants to grow rapidly and produce too much oxygen.

    C. the chemicals react with the water to form acid rain which the will kill the pond plants and animals.

    D. the chemicals cause plants to grow rapidly, blocking out the sun and depleting oxygen levels as they decay.

16. Biomagnification is a process

    A. where pollutants build up in the tissues of organisms and move up along the food chain

    B. that creates algal blooms with increased nutrient flow into water systems

    C. that is caused by a build-up of greenhouse gases in the atmosphere

    D. that removes pollutants from the environment by living things

Use the following information to answer the next 3 questions

Uptake of Heavy Metals by Two Plant Species

Concentration (ppm) — Heavy Metal: Chromium, Copper, Mercury, Zinc

Species A
Species B

17. Which plant species absorbs the most pollution?
    A. Species A is better than Species B
    B. Species B is better than Species A
    C. Species A, except for its ability to remove mercury from the soil
    D. Species B, except for its ability to remove mercury from the soil

18. This method of using plants to remove pollutants from the soil is called
    A. Biodegradation
    B. Phytoremediation
    C. Photolysis
    D. Dispersion

19. There are several different methods that can be used to determine air quality. Which of the following methods would provide the most useful information regarding air quality?
    A. Estimating the amount of emissions from pollution sources
    B. Determining the percent of oxygen present in the air
    C. Measuring the levels of pollutants in the air
    D. Identifying all pollutants present in the air

20. Three of the major air pollutants found in large urban areas include nitrogen oxides (NO_x), carbon monoxide (CO), and ground-level ozone (O_3). The main cause of these pollutants in large cities is
    A. The large population of people breathing the air
    B. The burning of oils and gases in industrial processes
    C. The production of large volumes of household waste
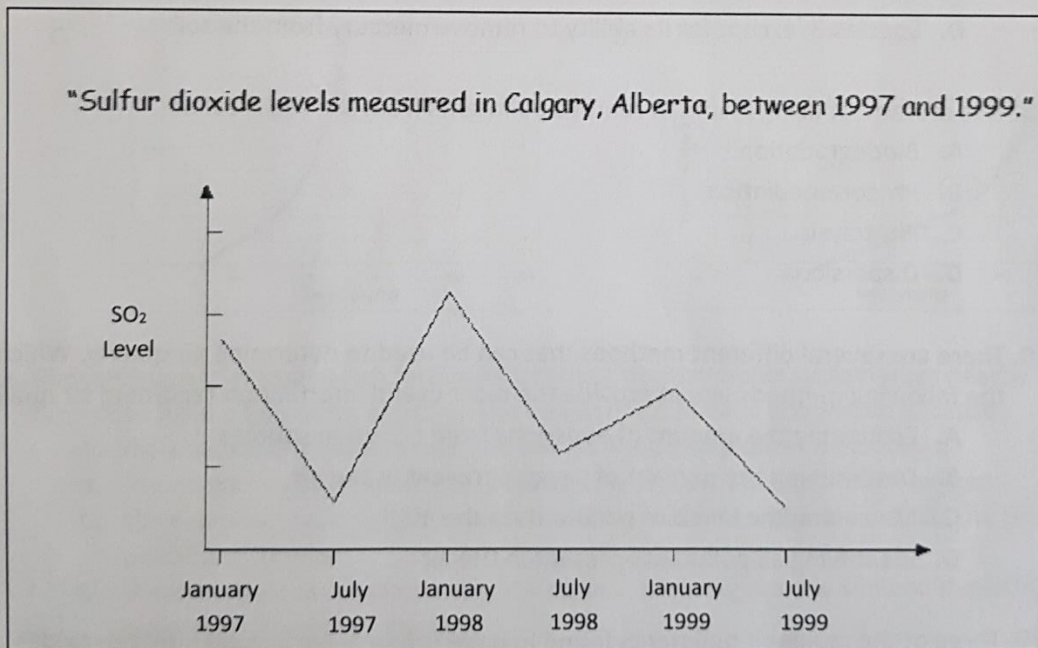   D. The combustion of fuel in gasoline-powered vehicles.

21. Three of the major air pollutants found in large urban areas include nitrous oxides (NO_x), carbon monoxide (CO), and ground-level ozone (O_3). Which of these contributes to acid rain?

    A. Nitrous oxides

    B. Carbon monoxide

    C. Ground-level ozone

    D. None of them contribute to acid rain

22. A group of university students recently found a way to genetically modify certain bacteria so that they could help clean up oil spills by consuming the oil. This is an example of

    A. biodegradation

    B. phytoremediation

    C. dispersion

    D. dilution

Use the following information to answer the next 2 questions

"Sulfur dioxide levels measured in Calgary, Alberta, between 1997 and 1999."

| January | July | January | July | January | July |
| 1997 | 1997 | 1998 | 1998 | 1999 | 1999 |

23. The results shown on this graph suggest that

    A. sulfur dioxide levels have risen from 1997 to 1999.

    B. sulfur dioxide levels have remained constant over the years shown.

    C. sulfur dioxide levels have continually decreased from 1997 to 1999.

    D. sulfur dioxide levels are higher in mid-winter compared to mid-summer levels
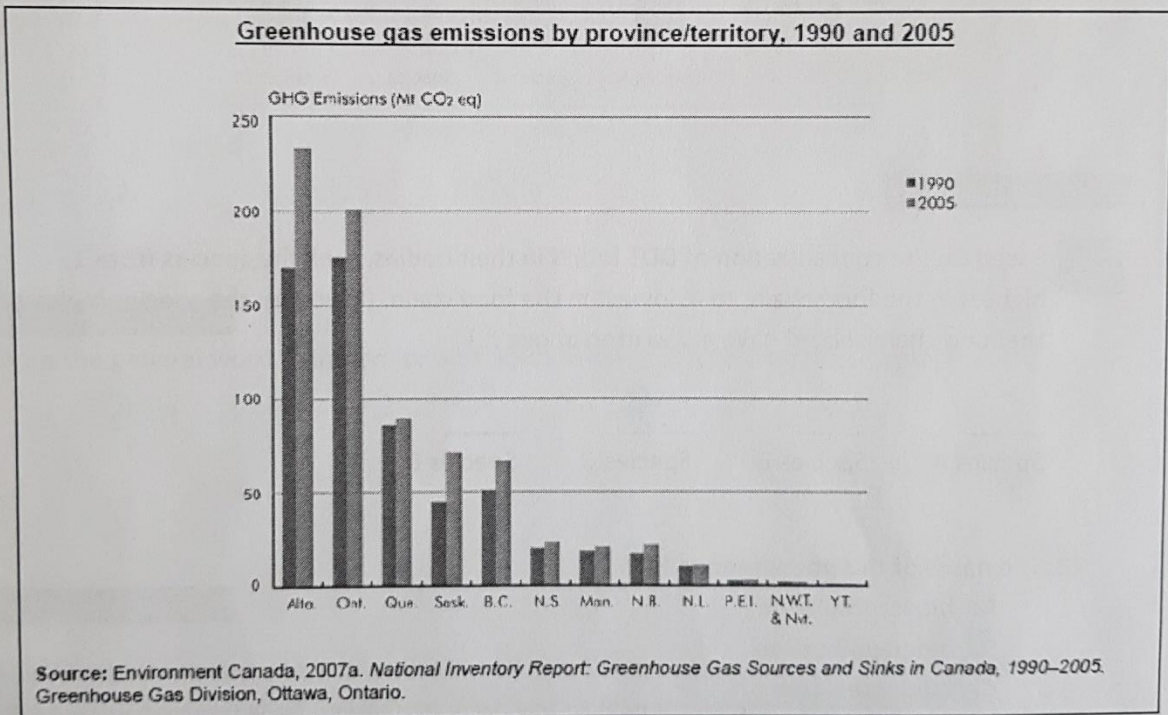
24. What technology can help reduce emissions of sulfur dioxide?

    A. scrubbers

    B. bioremediation

    C. dispersion

    D. biodegradation

25. What is the purpose of the ozone layer?

    A. to act as a shield, reflecting space and meteor shower debris.

    B. to trap solar energy so that it can be used as an alternative energy source

    C. to heat up Earth by trapping thermal energy generated from human activities

    D. to absorb much of the sun's harmful ultraviolet radiation

*Use the following information to answer the next question*

Greenhouse gas emissions by province/territory, 1990 and 2005

GHG Emissions (Mt CO₂ eq)

Source: Environment Canada, 2007a. *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada, 1990–2005.* Greenhouse Gas Division, Ottawa, Ontario.

26. Greenhouse gas emissions are a concern because they contribute to

    A. the enhanced greenhouse effect

    B. depletion of the ozone layer

    C. carbon dioxide saturation

    D. greenhouse depletion

27. Pollution emissions affect

    A. the city closest to the source

    B. cities far away from the source

    C. both A. and B.

    D. neither A. nor B.

Use the following information to answer the next 2 questions

Concentration of DDT in Four Species
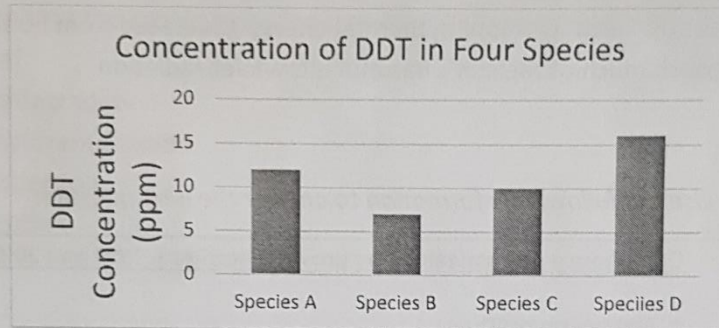
Numerical Response

1. Based on the concentration of DDT found in their bodies, rank the species from 1, highest in the food chain, to 4, lowest in the food chain. (Example: the species highest in the food chain should have a 1 written above it.)

2	4	3	1
Species A	Species B	Species C	Species D

28. The name of this phenomenon is

    A. bioaccumulation

    B. biomagnification

    C. biodegradation

    D. bioconcentration

In an experiment, students collected a water sample from a lake. In an effort to determine the quality of the water, students counted the number and types of macroinvertebrates present in the sample. The results are shown in the table below.

Macroinvertebrates in the Lake Sample

| Macroinvertebrate	Number of Individuals
Mayfly nymphs	23
Stonefly nymphs	41
Caddisfly larvae	67
Midge Larvae	111
Worms	203

Written Response 1

According to the data above, is the water quality of this lake high or low? Support your answer using data collected from the lake sample. (3 marks)

Probably low because there are lots of midge larvae and worms, which are pollution-tolerant. There are only a few individuals of pollution-intolerant species, so the lake is probably somewhat polluted (water quality is low)

Written Response 2

Write the general word equation for an acid-base neutralization reaction (1 mark)

acid + base → salt + water
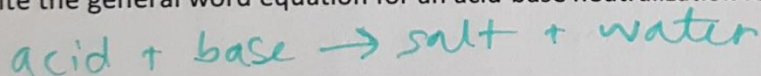
Written Response 3

A 5673 mL stream sample is taken from a lake and found to contain .03 mL of dissolved oxygen. What is the concentration, in ppm, of dissolved oxygen in the lake? (2 marks)

$$ppm = \frac{solute}{solvent} \times 1,000,000 = \frac{.03 mL\ O_2}{5673 mL} \times 1,000,000$$

$$= 5.29\ ppm\ dissolved\ O_2$$

The following data shows the relationship between the concentrations of dissolved oxygen and water temperature in a particular pond over 10 years.

Concentration of Dissolved Oxygen (ppm)	Water Temperature (°C)
10	15
8	30
6	50
4	70
2	90
0	100

a.) Use the information above to graph the relationship between concentration of dissolved oxygen and water temperature **(5 marks)**

Pond Water Data _____ (Title)

Water Temperature (°C)

Dissolved Oxygen (ppm)
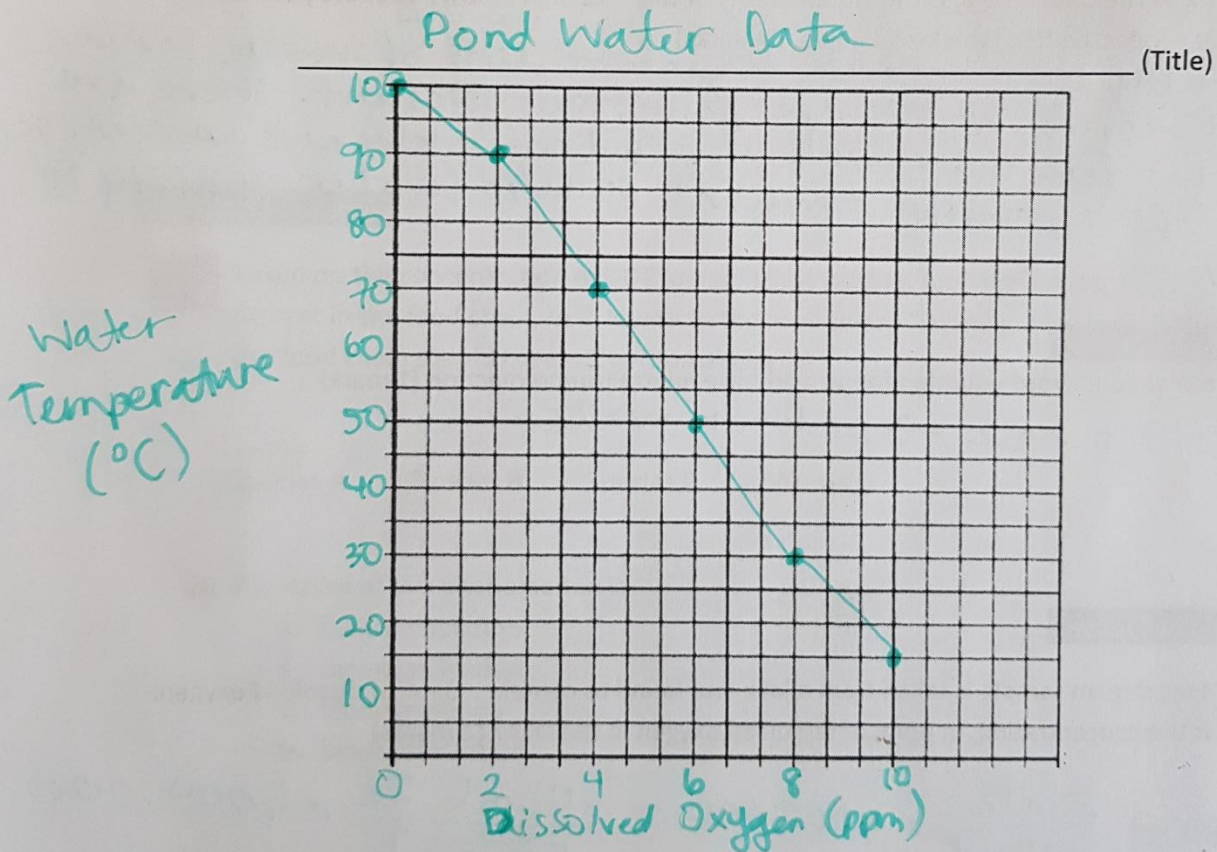
b.) Using the information from the graph, what is the relationship between oxygen concentration and water temperature? **(2 marks)**

~~oxygen concentration~~

As temperature increases, dissolved oxygen concentration decreases.