Name _____ Date _____
Period _____ "Biology Blizzard Bag #1"

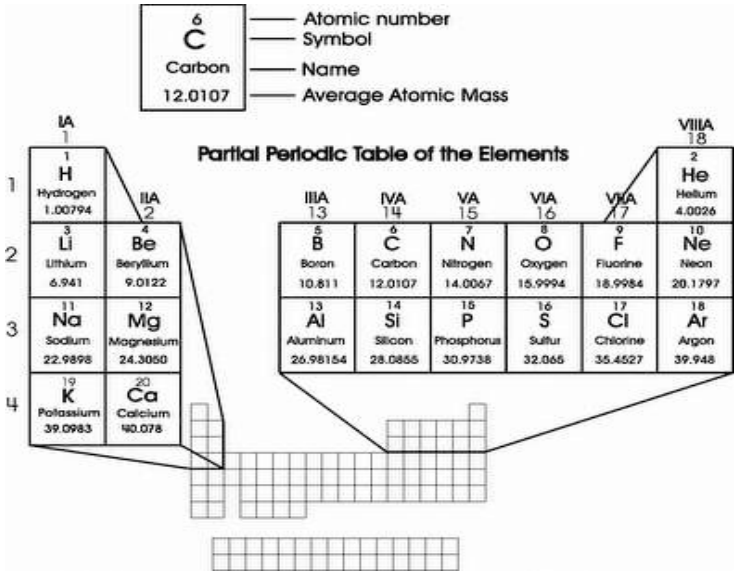
Directions:
Complete the two OGT review tests from the concepts we covered in the 1st semester in the spaces provided on the following pages. You may print out this test and write on it, or write your answers on a separate answer sheet.

1st Quarter Practice OGT Test

1. What gas does the process of photosynthesis release into the atmosphere?
   a. carbon dioxide
   b. hydrogen
   c. nitrogen
   d. oxygen

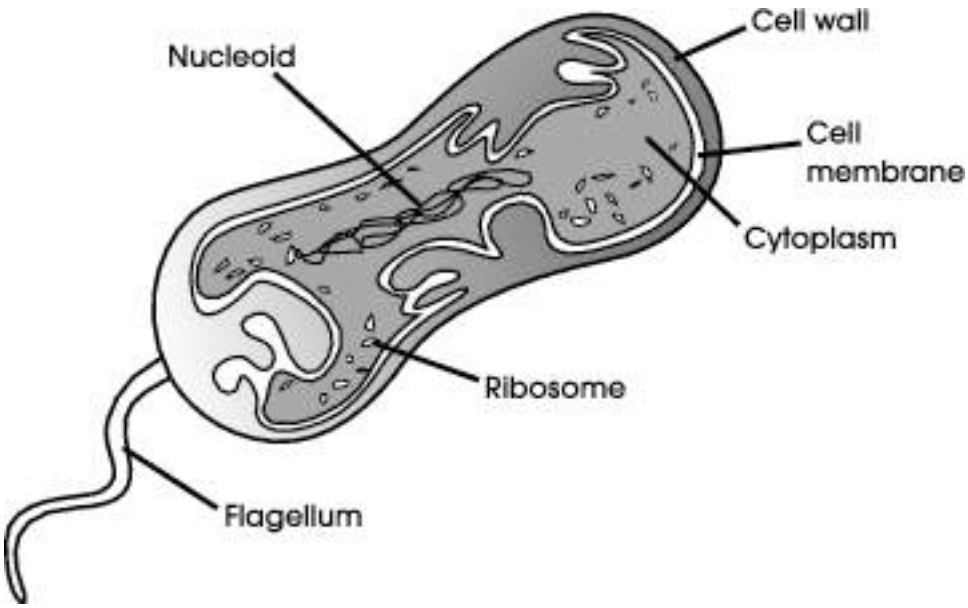
2. When methane (CH_4) is burned in the presence of oxygen (O_2), the two chemicals react together in a process called combustion. Which of these compounds could be a possible product of this combustion reaction?
   a. NH_3
   b. SO_2
   c. H_2O
   d. CS_2

3. Suppose scientists discovered four new elements (W, X, Y, Z) while studying rock and soil samples brought back from a Mars mission. Which Lewis dot structure represents an element that should be placed in column VIIA (17) of the periodic table?
   a. 
   b. 
   c. 
   d. 



4. A scientist uses a microscope to examine two slides of living bacteria. Each slide contains a different type of bacteria. While the cells on the first slide are moving rapidly, the cells on the second slide are stationary. Based on these observations, the cells on the second slide most likely have no
   a. nucleus.
   b. flagella.
   c. chloroplasts.
   d. mitochondria.

5. The picture below shows some of the structures in a single-celled organism.

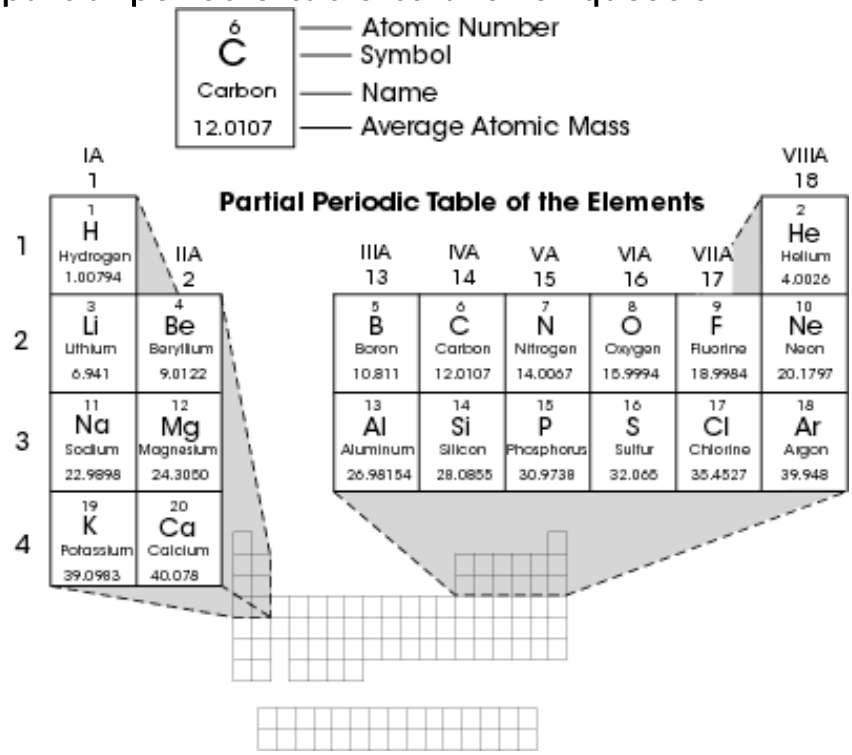


   The presence of which structure provides evidence that this organism is capable of locomotion?
   a. cell wall
   b. ribosome
   c. flagellum
   d. cytoplasm

6. Energy produced by cellular processes is stored as
   a. CO_2.
   b. ATP.
   c. DNA.

d. RNA.

Use the partial periodic table to answer question #7.



7. Would you normally expect neon (Ne) to form compounds?
   a. Yes, but neon is a rare gas and difficult to obtain.

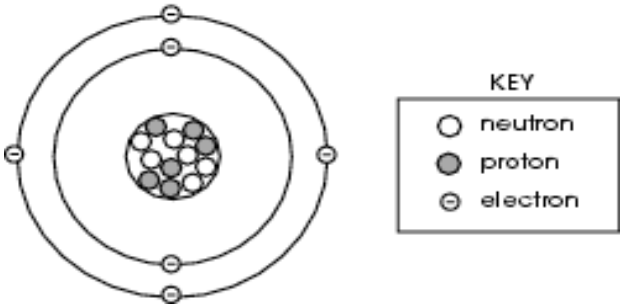
   b. No, neon needs six electrons to fill its outermost level.

   c. Yes, neon needs six electrons to fill its outermost level.

   d. No, neon has eight electrons in its outermost level and is stable.

Use the graphic to answer question #8.

Shell Model



8. Which element does the shell model represent?

a.

6
C
Carbon
12.0107

b.

9
F
Fluorine
18.9984

c.

12
Mg
Magnesium
24.3050

d.

11
Na
Sodium
22.9898

9. In 1864, Louis Pasteur was asked to investigate diseases afflicting the wine in Arbois, France. He discovered that these diseases were caused by micro-organisms that could be killed by heating the wine to 55°C for a period of time.

   What is this process called today that applies to milk?

   a. homeostasis

   b. fermentation

   c. differentiation

   d. pasteurization

10. What structure is absent in the cells of fungi thereby preventing them from performing photosynthesis?

    a. cilia

    b. nuclei

    c. chloroplasts

    d. mitochondria

2nd Quarter Practice OGT Test

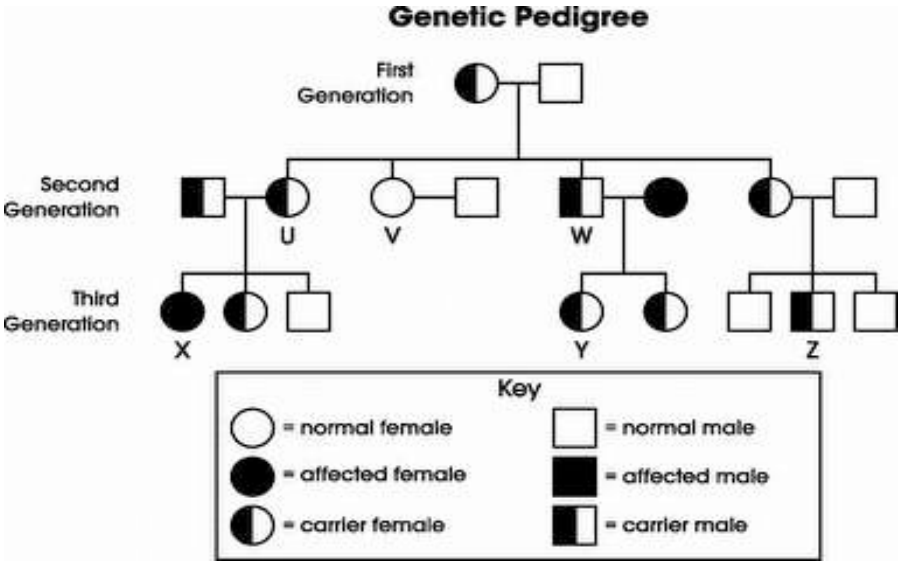
Use the following passage to answer #'s 1-4.

Sickle cell disease is a group of inherited disorders in which deoxygenated red blood cells become distorted and take on a shape like a sickle. There are two common alleles for this gene. One causes normally shaped red blood cells and the other allele causes the red blood cells to have a sickle shape. The sickled cells can lodge in the smallest blood vessels and reduce the circulation of blood to tissues.

The sickle cell allele is most common in areas where the disease malaria is a significant problem, and among people whose ancestors are from those areas. Evidence shows that having just one sickle cell allele makes a person resistant to malaria.

This genetic condition is a recessive trait. When an individual has only one allele for the sickle cell trait, the person is a carrier.

The pedigree below represents a family in which some members have the sickle cell allele.



1. In the genetic pedigree, person U and her husband are considering having another child.

   What is the percent chance that this child will develop sickle cell disease?

   a. 25%
   c. 75%
   b. 50%
   d. 100%

2. Draw a Punnett square or comparable diagram for the couple in the first generation of the pedigree. Use **B** to represent the allele for normal red blood cells and **b** to represent the allele for sickle cell disease. How do the couple's actual children compare to the expected results shown in your Punnett square? Respond in the space provided in your **Answer Document**. (4 points)

3. Although sickle cell disease has negative effects on those who suffer from it, the allele is widespread in many parts of the world. This is because in areas where malaria is a significant danger, the sickle cell allele

   a. ceases to cause symptoms.
   b. attacks the parasite that causes malaria.
   c. spreads rapidly in people weakened by malaria.
   d. conveys a health advantage to those who carry the allele.

4. Which person on the pedigree could not pass the allele for sickle cell disease to his/her offspring?

   a. V
   b. X
   c. Y
   d. Z

Use the following passage to answer #5.

In 2004, wildlife rescuers found a great horned owl nearly dead from starvation. The owl's eyes had formed cataracts, which cloud the natural lens and inhibit the eye's ability to focus and form clear images. Cataracts can be inherited or acquired as a result of aging, disease and/or use of certain medications. Without clear vision, the owl, named Minerva, had been unable to hunt.

Minerva was taken to the Veterinary School at the University of Wisconsin, Madison, after a local veterinarian confirmed the presence of cataracts. A pair of lenses specifically made for owls was implanted in Minerva's eyes. After the surgery and a recovery period, Minerva was moved to a large, enclosed area where small rodents were released and her ability to hunt was to be evaluated. Scientists confirmed that, if she showed a clear ability to hunt, she would be released back into her natural habitat.

5. The mutation for cataracts (c) occurs on a gene represented by the letter E. Owls that are homozygous for the mutation (E^cE^c) exhibit cataracts. Owls that are homozygous for normal eyes are EE and owls that are carriers of the mutation but do not exhibit cataracts are EE^c.

   What percentage of the offspring in a cross between parents with the genotypes EE and E^cE^c will exhibit cataracts?

   a. 0%

   b. 25%

   c. 50%

   d. 75%

Use the following passage to answer #'s 6 and 7.

A group of students designs an experiment to test how an herbicide affects pepper plants and weeds. Eight plots are tested, each of which holds 25 pepper plants and a variety of weeds. Plots 1 and 2 are not treated; plots 3 – 8 are treated with varying amounts of weed-killing herbicide. The weeds are counted in each plot during week 1. The herbicide is applied during week 2, and the weeds are counted again in week 3. The data are shown in the table below.

Effects of Herbicide on Plant Growth				
Plot	**Herbicide dose**	**Number of pepper plants that die before producing fruit**	**Week 1 number of weeds**	**Week 3 number of weeds**
1	No herbicide application	3	30	33
2	No herbicide application	5	35	40
3	50% of recommended dose	3	42	24
4	50% of recommended dose	3	43	14
5	100% of recommended dose	4	47	7
6	100% of recommended dose	6	42	3
7	150% of recommended dose	12	43	2
8	150% of recommended dose	15	45	5

6. Prior to herbicide application, a student notes that there are two related species of weeds (A and B) that occur in similar numbers in plot 5. Species A reproduces sexually and species B reproduces asexually. After exposing both weed populations to several applications of the herbicide, the student observes that the population of species B has become significantly smaller than the population of species A.

   Why did species A most likely have a survival advantage over species B?

   a. There was greater genetic variability in species A than there was in species B.
   b. The percentage of herbicide-resistant weeds decreased in species A but not in species B.
   c. Asexual reproduction allows the weeds to produce more offspring in a shorter period of time.
   d. Sexually reproducing weeds are better able to utilize nutrients from the herbicides than asexually reproducing weeds.

7. A student takes a herbicide-resistant weed from plot 3 and a herbicide-resistant weed from plot 4. He determines that both plants have dominant mutations in the gene that is responsible for herbicide resistance (H). The genotype of each plant is indicated below.

Weed from plot 3
Hh

Weed from plot 4
HH

In a cross between these two weeds, what percentage of the offspring would be resistant to the herbicide?

a. 0%

b. 25%

c. 50%

d. 100%

8. Color blindness is a sex-linked trait that is carried on the X chromosome. If a boy is born color-blind, what would have to be true?

a. His father had normal vision.

b. His grandmother was color-blind.

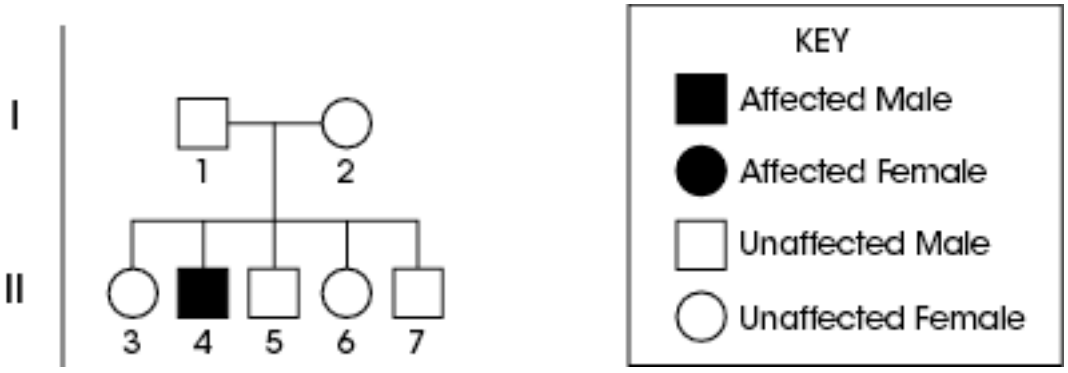
c. His mother carried at least one gene for color blindness.

d. His grandfather passed on the color-blind trait to his father.

9. Most bacteria reproduce asexually. Mammals reproduce sexually. Describe how these two methods of reproduction differ with respect to the genetic makeup of the offspring produced.

Respond in the space provided in your Answer Document.
(2 points)

10. The pedigree below shows the inheritance pattern of a recessive allele (z) that results in a genetic disease.



Based on the inheritance pattern, what are all the possible genotypes for individual 6?

a. Zz

b. ZZ and zz

c. ZZ and Zz

d. ZZ, Zz and zz