Name:_____ Block:_____ Date:_____

Chemistry 11 **Naming Alkanes** Assignment

Complete the following questions on a separate sheet of paper.

1. Determine the number of carbon atoms in the longest chain of each of the following, and name the parent hydrocarbon represented by the longest chain.

a.
```
C—C—C—C—C—C
           |
        C—C—C
```

b.
```
C—C—C—C—C
         |
C—C—C—C—C
         |
C—C—C—C—C
```

c.
```
      C
      |
C—C—C—C—C—C
      |   |
      C   C—C—C
      |
      C—C
```

d.
```
C—C—C—C—C—C—C—C
|   |   |   |
C   C   C   C
            |
            C—C
```

2. Name the following hydrocarbons. (Make sure you find the longest chain!)

a. $CH_3-CH_2-CH(CH_3)-CH_2-CH_2-CH_3$

b. $CH_3-CH_2-CH_2-CH(CH_3-CH_2)-CH_2-CH_2-CH_3$

c. $CH_3-CH_2-CH(CH_2-CH_3)-CH_2-CH_2-CH_2-CH_2-CH_3$

d. $CH_3-CH(CH_3)-CH_2-CH_2-CH_2-CH_3$

e. $CH_3-CH_2-CH_2-CH_2-CH_2-CH(CH_2-CH_2-CH_3)-CH_3$

f. $CH_3-CH(CH_2-CH_3)-CH_2-CH_2-CH_2-CH_3$

3. Draw the condensed structural formula for each of the following hydrocarbons.
   a. 3-methylhexane
   b. 4-ethyloctane
   c. 2-methylpentane
   d. 4-propylnonane
   e. 3-ethylheptane
   f. 5-propyldecane

4. Identify what is wrong with each of the following. (You may need to sketch the molecule to see the error in naming)
   a. 6-methylhexane
   b. 1-ethylbutane
   c. $CH_3-CH_3-CH(CH_3)-CH_3$
   d. $CH_3-CH(CH_3)-CH(CH_3)-CH_3$

5. Draw the condensed structural formula for each of the following hydrocarbons.
   a. 3-ethyl-2,3-dimethylhexane
   b. 2,2-dimethyl-5,6-dipropylnonane
   c. 4-ethyl-3-methyl-5-propyloctane
   d. 2,2,3,3-tetramethylpentane
   e. 3,4-diethylhexane
   f. 5-butyl-6,6-diethyl-3,3,7-trimethyldecane
   g. Dimethylpropane (why are no numbers used?)
   h. 4-ethyl-2-methyloctane
   i. Hexamethylpentane
   j. 3,6-diethyl-4-methyl-5-propyloctane

6. Name the following molecules.

a.
```
      CH3-CH-CH-CH3
          |   |
CH3-CH2-CH2 CH2-CH3
```

b.
```
CH3-CH2-CH-CH2-CH3
          |
CH3-CH2-CH-CH2-CH3
          |
CH3-CH2-CH-CH2-CH3
```

c.
```
     CH3                          CH3
      |                            |
CH3-C-CH2-CH2-CH2-CH2-C-CH3
      |                            |
     CH3                          CH3
```

d.
```
              CH3
               |
CH3-CH-CH-CH-CH2-CH3
     |         |
CH3-CH2      CH2-CH3
```

e.
```
                CH3
                 |
CH3-CH2-CH2-C-CH2-CH3
                 |
            CH2-CH2-CH2-CH3
```

f.
```
              CH3                CH3
               |                  |
CH2-CH2-CH-CH2-CH2-C-CH3
 |                                |
CH3                              CH3
```

g.
```
      CH2-CH2-CH3
       |
CH3-CH-CH2-CH-CH3
            |
      CH3-CH2-CH2
```

h.
```
CH2-CH2-CH2-CH2-CH2-CH2
 |                      |
CH2-CH3              CH3-CH2
```

i.
```
          CH3-CH-CH2-CH3
                |
CH3-CH2-CH-CH-CH2-CH3
          |
      CH2-CH-CH2-CH3
            |
           CH3
```

j.
```
                    CH3  CH3
                     |    |
CH3-CH2-CH2-CH-CH-C-CH3
                |        |
               CH3     CH2-CH3
```

k.
```
                    CH2-CH3
                       |
CH3-CH2-CH2-CH-CH-CH-CH3
               |       |
      CH3-CH2-CH2     CH2-CH3
```

l.
```
CH3-CH2
   |
CH3-CH-CH2
          |
CH3-CH2-CH-CH-CH3
                |
           CH2-CH-CH2-CH3
                |
               CH2-CH3
```