

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Which of the statements below accurately describe(s) alkanes?
- A) Alkanes are hydrocarbons which contain only single bonds.
 - B) Alkanes belong to the class of unsaturated hydrocarbons.
 - C) Alkanes are the simplest and least reactive class of organic compounds.
 - D) both A and B
 - E) both A and C

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

- 2) If a hydrocarbon has no double or triple bonds, it is said to be _____.

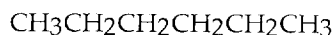
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 3) If an acyclic alkane hydrocarbon contains n carbon atoms, how many hydrogen atoms must it also contain?
- A) $2n + 2$
 - B) $2n$
 - C) n
 - D) $n - 2$
 - E) $n + 2$

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

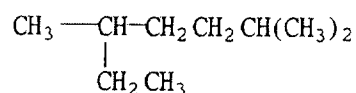
- 4) Predict the molecular formula of 4-ethyl-5,5-dimethyldodecane.

- 5) Provide an acceptable name for the alkane shown below.



- 6) Give structures for the three isomers with molecular formula C_5H_{12} and provide the common name of each.

- 7) Provide an acceptable name for the alkane shown below.



- 8) Draw an acceptable structure for 4-*t*-butyloctane.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 9) Consider the three isomeric alkanes *n*-hexane, 2,3-dimethylbutane, and 2-methylpentane. Which of the following correctly lists these compounds in order of increasing boiling point?
- A) *n*-hexane < 2-methylpentane < 2,3-dimethylbutane
 - B) 2,3-dimethylbutane < 2-methylpentane < *n*-hexane
 - C) *n*-hexane < 2,3-dimethylbutane < 2-methylpentane
 - D) 2-methylpentane < *n*-hexane < 2,3-dimethylbutane
 - E) 2-methylpentane < 2,3-dimethylbutane < *n*-hexane