


**Project Advance Chemistry 116 Sample Questions
on Material in *General Chemistry*, Brown, LeMay, and Bursten**

**Chapter 26. Organic Chemistry
Spring Semester 1996**

- The answer that fits the formula $\text{CH}_3\text{CH}_2\text{Cl}$ is
 - chloromethane
 - ethyl chloride
 - ethylene chloride
 - vinyl chloride
 - none of these.
- The answer that fits the formula $\text{CH}_3\text{CH}_2\text{Cl}$ is
 - alkyl chloride
 - chloromethane
 - ethylene chloride
 - vinyl chloride
 - none of these.
- Which of the following is the correct equation for the formation of acetylene from calcium carbide?
 - $\text{CaC}_2 + 2 \text{H}_2 \rightarrow \text{CH} \equiv \text{CH} + 2\text{Ca}$
 - $\text{CaC}_2 + 2 \text{H}_2 \rightarrow \text{CH}_2 = \text{CH}_2$
 - $\text{Ca}_2\text{C}_2 + 4 \text{H}_2\text{O} \rightarrow \text{CH}_2 = \text{CH}_2 + 2 \text{Ca}(\text{OH})_2$
 - $\text{CaC}_2 + 2 \text{H}_2\text{O} \rightarrow \text{CH} \equiv \text{CH} + \text{Ca}(\text{OH})_2$
 - none of these.
- The name of this compound, , is:
 - naphthalene
 - phenanthrene
 - triphenyl
 - tribenzyl
 - anthracene
- Which of the following will show geometric isomerism?
 - $\text{CH}_3\text{CH} = \text{CH}_2$
 - $\text{CH}_3\text{CH}_2\text{CH} = \text{CHCH}_2\text{CH}_3$
 - $(\text{CH}_3)_2\text{C} = \text{C}(\text{CH}_3)_2$
 - $\text{CH}_2 = \text{CHCH}_2\text{CH}_2\text{CH}_3$
 - $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$

6. Isopropyl alcohol, $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$, is a
- primary alcohol
 - secondary alcohol
 - tertiary alcohol
 - glycol
 - none of these.
7. An example of a tertiary alcohol is
- $(\text{CH}_3)_3\text{C-OH}$
 - $(\text{CH}_3)_2\text{C=O}$
 - $\text{CH}_3\text{CH}_2\text{CH}_2\text{C-OH}$
 - $(\text{CH}_3)_2\text{CH-O-CH}_2\text{CH}_2\text{CH}_3$
 - none of these.
8. The tenth member of the alkanes has
- 20 hydrogen atoms
 - 10 hydrogen atoms
 - 12 hydrogen atoms
 - 22 hydrogen atoms
 - 18 hydrogen atoms
9. The chief product when 2-butanol is heated with 50% sulfuric acid at 100°C is
- $\text{CH}_3\text{CH}=\text{CHCH}_3$
 - $\text{CH}_3\text{CH}_2\text{CH}=\text{CH}_2$
 - $\text{CH}_3\text{CH}_2\text{C}(\text{CH}_3)\text{H-O-C}(\text{CH}_3)\text{HCH}_2\text{CH}_3$
 - $\text{CH}_3\text{CH}_2\text{COCH}_3$
 - $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$
10. Which of these alcohols will not give a ketone when oxidized?
- 1-pentanol
 - 2-pentanol
 - 3-pentanol
 - 2-butanol
 - 2-hexanol
11. $\text{CH}_3\text{CH}_2\text{-NH-CH}_3$ is named:
- hydrogen methylethyl nitride
 - methylethyl amide
 - methylethyl ammonia
 - methylethyl cyanide
 - methylethylamine

12. Which of the following statements is(are) true?

- I. A methane molecule is composed of a carbon atom bonded to four hydrogen atoms. All five atoms lie in the same plane, and all bond angles are 90° .
 - II. Alkanes are also known as paraffins or saturated hydrocarbons.
 - III. Isobutane is named 2-methylpropane by the IUPAC naming system.
 - IV. The general formula for an alkane is C_nH_{2n+2} .
 - V. The products of the complete combustion of a hydrocarbon are carbon dioxide and water.
 - VI. The compound, 2,2,5,5-tetramethylhexane, contains 12 carbon atoms.
- (a) All the above statements are true.
 - (b) II, III, IV and V are true.
 - (c) Only II and IV are true.
 - (d) II, III, V and VI are true.
 - (e) None of the above statements is true.

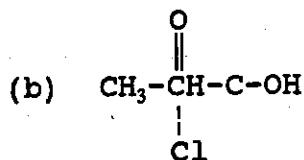
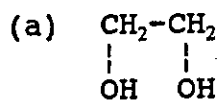
13. Which one of the following molecules does *not* contain a double bond?

- (a) CH_3CHO
- (b) CH_3CH_2OH
- (c) CO_2
- (d) CH_3CHCH_2
- (e) SO_2

14. How many different butyl alcohols are there?

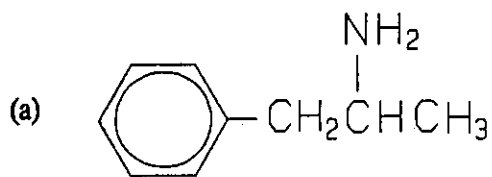
- (a) 1
- (b) 2
- (c) 3
- (d) 4
- (e) 5

15. Which of the following compounds displays optical isomerism?

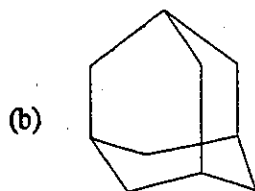


- (c) $CH_2=CHCl$
- (d) $CHCl=CHCl$
- (e) $CH_3-O-C_2H_5$

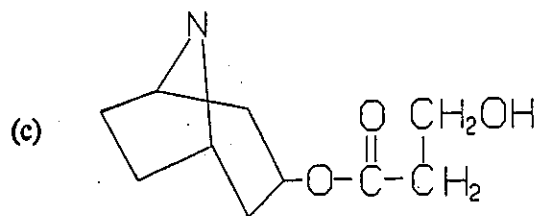
16. Which of the following drugs are not optically active?



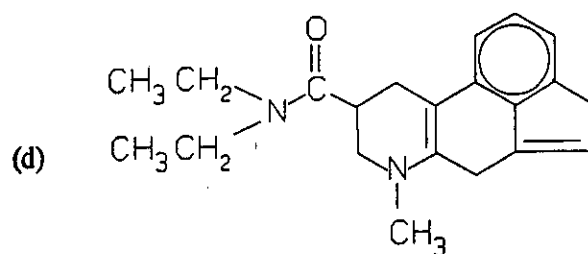
Benzedrine



Symmetrel



Atropine




Lysergic acid diethylamide - LSD

(e) none of these.

17. Which of the following statements is(are) true?

- I. A double bond consists of two equivalent bonds called pi bonds.
 - II. When hydrogen chloride reacts with $\text{CH}_2=\text{CH}_2$, the product is $\text{CH}_2=\text{CHCl}$.
 - III. The compound $\text{CH}_3\text{CH}=\text{CHCH}_3$ can have *cis-trans* isomers.
 - IV. The reactions of benzene show that it has three double bonds.
 - V. There is free rotation around a carbon-carbon double bond.
 - VI. 2-butene and 2-methyl-2-butene can both have *cis-trans* isomerism.
 - VII. Modern theory of the benzene structure includes π -bonding above and below the plane of the hexagon, and between all adjacent carbon atoms.
- (a) All the above statements are true.
 - (b) I, II, IV, V and VII are true.
 - (c) Only III and VI are true.
 - (d) Only III and VII are true.
 - (e) None of the above statements is true.

18. Which of the following statements is(are) true?

- I. Glycerol (glycerine) is a trihydroxy alcohol.
 - II. Alcohols have higher boiling points than ethers of comparable molecular weight.
 - III. Ethanol and dimethyl ether are isomers.
 - IV. Ethylene glycol is the major component of "permanent" types of antifreezes.
 - V. The compound, , is called *m*-bromophenol.
 - VI. CH_3OH is commonly called wood alcohol.
- (a) All the above statements are true.
 - (b) I, II, IV and VI are true.
 - (c) Only IV and VI are true.
 - (d) III, IV and VI are true.
 - (e) None of the above statements is true.

19. Which of the following statements is(are) *not* true?

I. The carboxyl group is $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C} \\ | \\ \text{H} \end{array}$.

II. An amine has the general formula R-NH_2 .

III. Carboxylic acids become less water soluble as the number of carbon atoms increases.

IV. Low and intermediate molecular weight esters usually have fragrant or fruity characteristic odors.

V. A soap or synthetic detergent is able to clean oil and grease because part of the molecule is highly water soluble and the other part, a long carbon chain, is soluble in the oil or grease.

VI. Ring compounds in which all the atoms of the ring itself are not alike are called heterocyclic compounds.

VII. A compound of formula $\text{C}_6\text{H}_{12}\text{O}$ cannot be a carboxylic acid.

(a) All the above statements are false.

(b) Only VII is false.

(c) Only I is false.

(d) II, III, and VII are false.

(e) None of the above statements is false.