

Test # 1 Name \_\_\_\_\_

Directions: Each question has only one correct answer. Mark with X one of the lettered choices.

1. The mass number and atomic number of the lithium atom are shown by the symbol  ${}^7_3\text{Li}$ . What is the correct symbol for the lithium ion in lithium chloride?

- A)  ${}^6_2\text{Li}^-$       B)  ${}^6_3\text{Li}^+$       C)  ${}^7_3\text{Li}^+$       D)  ${}^7_3\text{Li}^-$

2. In period 3 of the periodic table the atom with the largest atomic radius is located in group:

- A) 1      B) 3      C) 5      D) 7

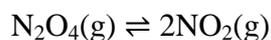
3. Which molecule is a polar molecule?

- A)  $\text{N}_2$       B)  $\text{CH}_4$       C)  $\text{CO}_2$       D)  $\text{H}_2\text{O}$

4. Which substance has a polar covalent bond between its atoms?

- A)  $\text{NaH}$       B)  $\text{NaCl}$       C)  $\text{F}_2$       D)  $\text{NH}_3$

5. Dinitrogen tetroxide,  $\text{N}_2\text{O}_4$ , breaks down into nitrogen dioxide,  $\text{NO}_2$ .



The reaction is reversible and endothermic. Which conditions will give the largest yield of nitrogen dioxide?

- A) high temperature and high pressure      B) low temperature and low pressure  
C) high temperature and low pressure      D) low temperature and high pressure

6. All of the factors listed below increase the rate of reaction  $\text{CH}_3\text{COOH} + \text{CH}_3\text{OH} \longrightarrow$  except:

- A) increase in pressure      B) adding of catalyst  
C) increase in temperature      D) increase in methanol concentration

7. Which of the following dilute solutions has the lowest pH?

- A) 0.010 mol/L  $\text{HCl}$       B) 0.010 mol/L  $\text{NaOH}$   
C) 0.010 mol/L  $\text{CH}_3\text{COOH}$       D) 0.010 mol/L  $\text{NH}_4\text{OH}$



17. Compounds that have the same composition but differ in their structural formulas:

- A) are called isomers  
 B) are called polymers  
 C) have the same properties  
 D) are usually alkanes

18. The reaction  $C_2H_4 + H_2 \rightleftharpoons C_2H_6$  is an example of:

- A) addition  
 B) substitution  
 C) elimination  
 D) condensation

19. Considering the Markovnikov's rule, which of the following is the major product of the reaction between 2-methyl-2-butene and HCl?

- A)  $CH_3-CH_2-\overset{\overset{CH_3}{|}}{C}Cl-CH_3$   
 B)  $CH_3-\overset{\overset{Cl}{|}}{CH}-\overset{\overset{CH_3}{|}}{CH}-CH_3$   
 C)  $CH_2Cl-CH_2-\overset{\overset{CH_3}{|}}{CH}-CH_3$   
 D)  $CH_3-CH_2-\overset{\overset{CH_2Cl}{|}}{CH}-CH_3$

A)

20. The compound  $CH_3COOC_2H_5$  is classified as:

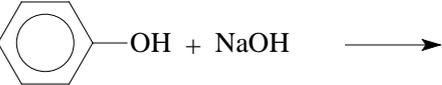
- A) a hydrocarbon  
 B) an ester  
 C) an alcohol  
 D) an acid

21. Which organic structure is ethanoic acid?

- A)  $CH_3CH_2C(=O)OH$   
 B)  $CH_3C(=O)OH$   
 C)  $HC(=O)OH$   
 D)  $CH_3CH(CH_3)C(=O)OH$

B)

22. Which of the following reactions does not produce salt?

- A)   $\text{C}_6\text{H}_5\text{OH} + \text{NaOH} \longrightarrow$   
 B)  $\text{HCOOH} + \text{Na}_2\text{CO}_3 \longrightarrow$   
 C)  $\text{CH}_3\text{CH}_2\text{NH}_2 + \text{H}_2\text{SO}_4 \longrightarrow$   
 D)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH} + \text{NaOH} \longrightarrow$

D)

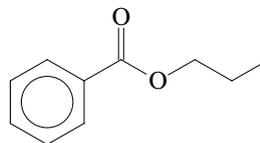
23. Which of the following compounds has an enantiomer?

- A)  $\begin{array}{c} \text{CH}_2\text{CH}_3 \\ | \\ \text{H}-\text{C}-\text{Cl} \\ | \\ \text{CH}_3 \end{array}$   
 B)  $\begin{array}{c} \text{CH}_2\text{CH}_3 \\ | \\ \text{H}-\text{C}-\text{Cl} \\ | \\ \text{CH}_2\text{CH}_3 \end{array}$   
 C)  $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}-\text{C}-\text{OH} \\ | \\ \text{CH}_3 \end{array}$   
 D)  $\begin{array}{c} \text{C}_2\text{H}_5 \\ | \\ \text{H}-\text{C}-\text{OH} \\ | \\ \text{C}_2\text{H}_5 \end{array}$

A)

24. Addition of hydrogen to aldehydes produces:

- A) secondary alcohols  
 B) carboxylic acids  
 C) alkanes  
 D) primary alcohols



25. According to IUPAC rules, the name of the molecule is:

- A) phenyl propanoate  
 B) benzyl propanoate  
 C) propanoyl benzene  
 D) propyl benzoate

26. Which compound is an amide?

- A)  $C_6H_5-CONH_2$   
 B)  $C_6H_5-CN$   
 C)  $C_6H_5-CH_2-NH-C_6H_5$   
 D)  $C_6H_5-COONH_2$

27. The building unit of starch is:

- A)  $\alpha$ -glucose  
 B)  $\alpha$ - and  $\beta$ -glucose  
 C)  $\alpha$ -glucose and  $\alpha$ -mannose  
 D)  $\beta$ -glucose

28. Which of these is a secondary amine?

- A)  $CH_3-\overset{O}{\parallel}C-NH_2$   
 B)  $CH_3CH_2\overset{CH_2CH_3}{|}NCH_2CH_3$   
 C)  $CH_3CH_2NH_2$   
 D)  $CH_3CH_2NHCH_3$

29. Decarboxylation of heptanoic acid produces carbon dioxide and:

- A) hexane  
 B) benzene  
 C) cyclohexane  
 D) hexene

30. Peptides are:

- A) products of amino acids polymerization  
 B) polyamides of amino acids  
 C) polyesters of amino acids  
 D) salts obtained after neutralization of amino groups with carboxylic groups of amino acids